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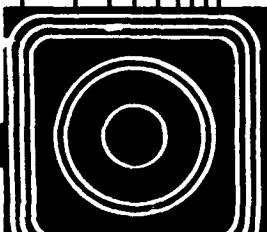
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DISCRETE SEMICONDUCTOR DEVICE RELIABILITY

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DISCRETE SEMICONDUCTOR DEVICE RELIABILITY

1988

Prepared by:

Mary G. Priore
The Reliability Analysis Center

Under Contract to:

Rome Air Development Center
Griffiss AFB, NY 13441-5700



Reliability Analysis Center

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PREFACE

This book is the fourth in a series of RAC data publications dealing with discrete semiconductor device reliability. It offers a detailed presentation of transistor, diode and optoelectronic device failure experience data as well as failure mode and mechanism information. Pertinent analyses have been performed on the available data, investigating trends and presenting conclusions. The data in this publication covers the 1976-1987 time span and has been collected from both military and commercial data sources.

DSR-4 is intended to supplement the data and guidelines in various military publications such as MIL-HDBK-217E and is not intended to be used in lieu of contractually cited references.

Other available RAC databooks treat the reliability experience of microcircuit, hybrid, and nonelectronic components.

Major technical contributors to this effort were David Coit, David Mahar and William Crowell. Typing and assembly were performed by Jeanne Lasher.

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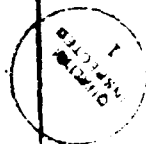


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SUMMARY

The objective of this publication is to update the discrete semiconductor device reliability data and information currently available to the reliability community.

Field and test failure data are presented in detailed and summarized formats on state-of-the-art transistors, diodes, and optoelectronic devices. In addition to the standard component types, particular emphasis was given to the collection of data on the following low population part types:

- GaAs Power FETs
- Varistor Diodes
- Infrared LEDs
- Current Regulator Diodes
- Microwave Diodes and Transistors
- Liquid Crystal Displays
- Photovoltaic Cell Arrays
- Transient Suppressor Diodes
- Diode Array Displays
- Microwave Diodes
- Microwave Transistors

Table 1 summarizes the data presented in this publication.

Significant issues with respect to discrete semiconductor device reliability are investigated including the validity of the exponential time to failure distribution, the effect of technological advances on device reliability, and the effects of electrical parameter derating. In addition, failure mode and mechanism data is presented for transistors, diodes, liquid crystal displays and photovoltaic cell array modules.

TABLE 1: DISCRETE SEMICONDUCTOR DEVICE DATA SUMMARY

Part Type	Number of Data Records	Number of Parts	Number Failed	Part Hours (x 10 ⁶)
Diode, Small Signal, Switching	32	932456	86	881.355376
Diode, Small Signal, General Purpose	9	77496	3	87.141567
Diode, Rectifier	61	5975662	452	7707.224018
Diode, Rectifier, Fast Recovery	33	115323	24	104.171995
Diode, Rectifier, Bridge, Full Wave	1	1524	0	0.829055
Diode, Zener	43	346672	78	450.773352
Diode, Zener, Voltage Regulator	141	1850646	363	2310.877217
Diode, Zener, Voltage Reference	58	1910126	254	2474.358388
Diode, Current Regulator	1	9342	2	12.144600
Diode, Suppressor, Transient	7	9580	7	7.144734
Diode, Microwave, Tunnel	8	178400	72	231.920000
Diode, Microwave, Schottky Barrier	10	85410	55	82.827817
Diode, Microwave, PIN	3	151200	531	4976.380000
Diode, Microwave, Variable Capacitance (Varactor)	19	107801	30	139.247881
Diode, Microwave, Gunn Effect	6	N/R	40	4.727000
Diode, Microwave, IMPATT	11	290	90	0.640441
Transistor, Bipolar, NPN	304	716759	369	712.405600
Transistor, Bipolar, PNP	271	20049502	2675	25882.522883
Transistor, Field Effect, Junction, N-Channel	32	3912243	864	5048.180613
Transistor, Field Effect, Junction, P-Channel	9	105979	14	135.061278
Transistor, Field Effect, MOS, N-Channel	25	272135	206	354.113868
Transistor, Field Effect, MOS, P-Channel	4	6125	5	8.021500
Transistor, Unijunction	10	60670	22	76.927681

(Cont'd on next page)

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TABLE 1: DISCRETE SEMICONDUCTOR DEVICE DATA SUMMARY (CONT'D)

Part Type	Number of Data Records	Number of Parts	Number Failed	Part Hours (x10⁶)
Transistor, Microwave/RF, Field Effect	41	24577	325	33.875084
Transistor, Microwave/RF, Bipolar	26	212527	2744	1329.871924
Transistor, Multiple, Complementary Pair	1	2044	0	6.489335
Transistor, Multiple, Darlington	65	84760	57	81.187626
Transistor, Multiple, Matched Pair	1	508	1	0.276358
Transistor, Special Function, Chopper	2	150295	5	195.383500
Thyristor	26	756159	253	977.729784
Thyristor, SCR (Silicon Controlled Rectifier)	1	4356	1	5.662800
Thyristor, Triac	2	30755	27	39.981500
Thyristor, Triode, Trigger	2	5398	19	7.017400
Optoelectronic Device, Emitter, Single LED	35	7561892	34	9830.459600
Optoelectronic Device, Emitter, Single LED, Infrared	4	30208	39	40.215060
Optoelectronic Device, Emitter, LED Array	25	218351	240	283.845940
Optoelectronic Device, Emitter, Laser Diode	18	664	293	3.715991
Optoelectronic Device, Sensor, Photodiode	4	174	0	0.282200
Optoelectronic Device, Sensor, Phototransistor	2	35956	7	46.742800
Optoelectronic Device, Photocoupler	8	90592	282	118.461484
Optoelectronic Device, Photocoupler, Phototransistor Output	11	147625	108	190.376294
Optoelectronic Device, Photocoupler, Photodarlington Output	1	22621	1	29.407330
Optoelectronic Device, Photocoupler, IC Output	4	192446	61	250.179800
Optoelectronic Device, Alpha Numeric Display, LED,	28	3059359	126	3977.166700
Segment Type				
Optoelectronic Device, Alpha Numeric Display, LED,	7	174030	19	226.239000
Array Type				
TOTALS	1,412	339,680,348	10,884	69,363.56437

INTRODUCTION

This book provides up-to-date failure rate information on discrete semiconductor devices. The data, including both field experience and test data, spans the period from 1976-1987 updating the pre-1978 DSR-3 data.

Data is presented on all transistors, diodes and optoelectronic part types currently covered in MIL-HDBK-217E as well as special or low-population parts including:

- GaAs Power FETs
- Transient Suppressor Diodes
- Infrared LEDs
- Diode Array Displays
- Current Regulator Diodes
- Photovoltaic Cells
- Liquid Crystal Displays
- Microwave Diodes
- Microwave Transistors

Although liquid crystal displays are not semiconductor devices, the RAC regularly receives inquiries from users requesting information as to their reliability and will use this databook as the medium for presenting such information.

Pertinent device and application-specific details characterizing the device failure are presented in the detailed data section including:

- Device Type
- Package Type
- Screen Level
- Application Environment
- Temperature
- Electrical Stress
- Number Tested
- Number Failed
- Part Hours

Failure mode and mechanism data was compiled for transistors and diodes from reliability demonstration test reports and is presented in both tabular and graphical formats. Data from individual data sources is presented for photovoltaic cell modules and liquid crystal displays. Such data is critical to Failure Modes, Effects and Criticality Analyses (FMECAs).

Various graphical analyses and comparisons are performed on the data and results are discussed from a reliability perspective. In addition, a comparison of DSR-4 field failure rates against DRS-3 field failure rates was conducted to determine the effects of processing and technology changes over the last 10-15 years.

1.0 USER'S GUIDE TO DSR-4

The data and information presented in this publication are intended to aid the reliability engineer in assessing the reliability of electronic systems and equipment containing discrete semiconductor devices. The user is cautioned, however, that this data is intended as a supplement to the information in military documents such as MIL-HDBK-217E, Reliability Prediction of Electronic Equipment, and shall not be used in lieu of contractually cited references.

Data is presented on the gamut of discrete semiconductor devices including small signal, rectifier, and zener diodes; bipolar and field effect transistors, microwave diodes and transistors. Of particular interest will be the data presented on low population, state-of-the-art devices which are either not addressed in other reliability-related documents or for which available data is out-of-date and/or scarce.

This data book is organized into the following four sections:

- 2.0 Failure Data Analyses
- 3.0 Failure Mode and Mechanism Data
- 4.0 Detailed Failure Data
- 5.0 Data Sources

Section 2.0 presents the results of various analyses performed on the detailed data presented in Section 4.0. First, data summaries are presented for generic component categories for which there was sufficient field failure data. The data in these analyses included data from five data sources (designated as Sources 1 through 5) which are described in detail in Section 5.0. Based on the data in this table, graphical comparisons are made between various diode and transistor types, respectively. These comparisons are intended to assist engineers in design trade-off decisions.

A graphical comparison between component failure rates from the various data sources is also presented. Data Sources 1 through 3 represent airborne applications which employ military-grade (JANTX) components. Data Source 4 provided data from a military naval environment also employing military grade (90% JANTX, 10% JAN) components, and data Source 5 provided data from a number of commercial laboratory-type equipments with unscreened components (77.5% plastic encapsulated and 22.5% hermetically sealed).

The second analysis in Section 2.0 is an investigation of the validity of the exponential time-to-failure assumption, which is the basis for all MIL-HDBK-217E-type semiconductor failure rate prediction models. The validity of this assumption has been challenged often since it assumes a constant failure rate over time while most failure mechanisms affecting discrete semiconductor devices are reported in the literature as fitting a log-normal distribution.

The third analysis presented in Section 2.0 investigates the impact of design and processing technology advances made over the last 10-15 years on observed field failure rates. To perform this investigation, field data in this publication is compared with field failure data from similar equipments presented in its' predecessor DRS-3 (dated 1979).

The final analysis presented in Section 2.0 is an investigation of the effects of electrical stress on component failure rates. Several publications such as RADC-TR-84-254, Reliability Derating Procedures and ESD-TR-85-145, Derated Application of Parts for ESD Systems, stress the benefits of electrical derating on equipment reliability. These effects are investigated for part types for which sufficient stress level information was available.

Section 3.0 presents failure mode and mechanism data for transistors and diodes compiled from reports of reliability demonstration tests conducted in accordance with MIL-STD-781, Reliability Design, Qualification and Production Acceptance Tests: Exponential Distribution. This data was limited to MIL-STD-781 type data to ensure all tests were conducted and evaluated against similar criteria. An exception was made for two low-population part types: liquid crystal displays and photovoltaic modules. Since so little data is available on these parts, other sources of information were allowed. Failure mode and mechanism distributions are critical to the performance of an accurate Failure Mode Effects and Criticality Analysis (FMECAs)

Section 4.0 presents the detailed failure data. The data is segregated first by general component category, then within each category by part number and data type (field or test). The device categories presented are:

Diode

- Small Signal, Switching
- Small Signal, General Purpose
- Rectifier
- Rectifier, Fast Recovery
- Rectifier, Bridge, Full Wave
- Zener
- Zener, Voltage Regulator
- Zener, Voltage Reference
- Current Regulator
- Transient Suppressor
- Microwave, Tunnel
- Microwave, Schottky Barrier
- Microwave, PIN
- Microwave, Varactor
- Microwave, GUNN Effect
- Microwave, IMPATT

Transistor

- Bipolar, NPN
- Bipolar, PNP
- Field Effect, Junction, N-channel
- Field Effect, Junction, P-channel
- Field Effect, MOS, N-channel
- Field Effect, MOS, P-channel
- Unijunction
- Microwave/RF, Field Effect
- Microwave/RF, Bipolar
- Multiple, Complementary Pair
- Multiple, Darlington
- Multiple, Matched Pair
- Special Function, Chopper

Thyristor

- Thyristor
- SCR
- TRIAC
- Triode, Trigger

Optoelectronic

- Emitter, Single LED
- Emitter, Single LED, Infrared
- Emitter, LED Array
- Emitter, Laser Diode
- Sensor, Photodiode
- Sensor, Phototransistor
- Photocoupler,
- Photocoupler, Phototransistor Output
- Photocoupler, Photodarlington Output
- Photocoupler, IC Output
- Alphanumeric Display, LED, Segment Type
- Alphanumeric Display, LED, Array Type
- Alphanumeric Display, Liquid Crystal
- Photovoltaic Module

Pertinent device and application-specific details are presented for each data record. The field and associated field values in the detailed data section are explained in Section 4.0.

Although the majority of data contained in the database is from field operation, there is some test data presented that is the result of high temperature operating life tests performed by either part manufacturers or as a result of specialized research projects. Although such tests are not representative of actual usage conditions, it is often the only failure data available for state-of-the-art components and/or low usage part types which have not had sufficient time to accumulate field data. This was the case for GUNN diodes, GaAs FETs, and laser diodes. Often such data is used to approximate operating conditions by assuming it represents a ground benign environment at elevated temperatures. The temperature effects are extrapolated to typical operating temperatures by assuming that the Arrhenius relationship is valid.

The Arrhenius relationship models the reaction rate of discrete semiconductor failure mechanisms within a specific temperature range. The Arrhenius model is based on empirical data and predicts that the rate of a given chemical or physical reaction, in this case a failure mechanism, will be exponential with the inverse of temperature. Conceptually, the Arrhenius model is given by:

$$\text{Reaction Rate} \propto \exp (-E_a/KT)$$

where:

E_a = activation energy (eV) (Every chemical reaction has a unique activation energy associated with it)

K = Boltzman's constant

$$= 8.63 \times 10^{-5} \text{ (eV/}^\circ\text{K)}$$

T = temperature ($^\circ\text{K}$)

The observed failure rate at an elevated temperature can be extrapolated to usage conditions as follows:

$$\lambda_2 = \lambda_1 \exp [-E_a/K (1/T_1 - 1/T_2)]$$

where:

λ_2 = usage failure rate estimate at T_2

λ_1 = test failure rate observed at T_1

E_a = activation energy

K = Boltzman's constant

T_2 = usage operating temperature ($^{\circ}\text{K}$)

T_1 = test temperature ($^{\circ}\text{K}$)

The caveat with this approach is that each failure mechanism has a unique activation associated with it. Furthermore, during the life of discrete semiconductor components, there can be several such mechanisms proceeding simultaneously, each capable either individually or jointly of causing a part failure. Reference 15 presents one approach to dealing with this discrepancy.

It has been found, however, that for general classes of components with similar failure mechanism distributions the cumulative effects of the various reactions can be approximated by a single Arrhenius model for a specified temperature range. This relationship has been designed as the "equivalent Arrhenius relationship." This is the approach used in generic failure rate prediction models such as those in MIL-HDBK-217E.

Section 5.0 is a detailed description of the sources of data for this publication.

TABLE 2: AVERAGE COMPONENT FAILURE RATE (failures/10⁶ hours) BY DATA SOURCE

Device Type	MIL-Grade					Commercial				
	Source #1	Source #2	Source #3	Source #4	Source #5	Source #1	Source #2	Source #3	Source #4	Source #5
DIODE										
Small Signal Switching	0.059 (19)	1.809 (1)	0.510 (1)	0.041 (2)	---	---	---	---	---	---
Rectifier	0.196 (14)	---	0.292 (4)	0.385 (7)	---	---	---	---	---	0.056 (13)
Rectifier, Fast Recovery	0.255 (16)	0.516 (2)	---	---	---	---	---	---	---	---
Zener	0.117 (58)	5.427 (3)	0.085 (4)	0.267 (4)	---	---	---	---	---	0.123 (43)
Current Regulator	---	---	---	---	---	---	---	---	---	0.147 (1)
Varistor/Suppressor	1.230 (4)	---	1.176 (1)	---	---	---	---	---	---	---
Tunnel	---	0.482 (3)	0.389 (3)	---	---	---	---	---	---	0.207 (23)
Varactor	---	---	---	---	---	---	---	---	---	0.235 (6)
TRANSISTOR										
Bipolar, < 5W	0.251 (272)	5.103 (7)	2.613 (5)	0.158 (4)	---	---	---	---	---	0.092 (28)
Bipolar, >= 5W	0.847 (34)	---	---	0.937 (1)	---	---	---	---	---	0.272 (21)
Field Effect	0.234 (14)	---	3.067 (1)	---	---	---	---	---	---	0.189 (8)
Unijunction	---	---	---	---	---	---	---	---	---	0.307 (5)
Darlington	0.812 (46)	---	---	---	---	---	---	---	---	---
THYRISTOR	4.682 (10)	---	---	0.978 (1)	---	---	---	---	---	0.175 (13)
OPTOELECTRONIC										
LED	---	---	---	---	---	---	---	---	---	0.003 (11)
Photocoupler	---	---	---	---	---	---	---	---	---	0.446 (8)
----- = insufficient data (###) = number of data points										

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2.0 DATA ANALYSIS

2.1 DATA SUMMARIES

The table and figures presented in this section are summaries of the data presented in the detailed data section, Section 4.0. Only part types for which there was a sufficient quantity of data were included in the summaries. In general this excludes low population parts such as microwave devices, most optoelectronics, etc.

Table 2 presents generic component failure rates for the five predominant data sources which provided data for this publication. The five sources are described in detail in Section 5.0, Data Sources. Briefly, Source 1 data is a conglomerate of data from all 16 MIL-HDBK-217 avionic environments, Sources 2 and 3 data are from an airborne, inhabited fighter environment, Source 4 data is from a naval submarine application, and Source 5 data is collected from a number of laboratory equipments in a controlled environment. Source 1 through 4 data contains military grade components (i.e., JANTX or JAN screen level and hermetically sealed) and Source 5 data contains unscreened parts, predominantly plastic encapsulated. The number of data points reflected in the failure rate entries is in parenthesis next to the failure rate to allow the user to exercise judgment when evaluating the data.

Figure 1 is a comparison of diode failure rates for the purpose of design trade-off decisions. Only data from the airborne data sources was used for this comparison in an attempt to minimize any differences introduced by environmental and application-type effects. Figure 2 presents similar information for transistors.

Figures 3 and 4 compare the average diode and transistor failure rates respectively for the five data sources in Table 1. It is evident that components from data Sources 2 and 3, namely the F-16 HUD and F-16 FCC, are consistently higher failure rate items. When the aspects of the various data sources are examined closely, this is not surprising. The F-16 equipments experience relatively higher levels of vibration and shock than the other equipments (particularly from Sources 4 and 5). Additionally, fighter aircraft equipment, in particular, experience high levels of power and thermal cycling including both a greater quantity of cycles and much shorter cycling intervals. Furthermore observed failure rates for similar devices can differ for several reasons including the natural variability in the data, different data collection practices, equipment design, and both component and equipment manufacturing and screening procedures. Data Source 5 failure data, as explained in Section 5.0, is first year warranty data from commercial applications. As such it is important to point out that long term failure mechanisms such as moisture and contaminant related failure mechanisms of plastic encapsulated devices are not reflected in the data.

It should also be noted that in addition to the variation in equipments, there are many sources of variability in the reliability data collected at the part level. Some of this variability is due to:

- Inaccuracies in failure reporting
- Inconsistencies in the criteria used to detect failure
- Quality differences between manufacturers
- Random, induced failures appearing as inherent failures

RAC has attempted to make a homogenous dataset from all the various sources by choosing only confirmed failures that were not induced, however the process to combine these sources cannot be 100% effective. One predominant source of reliability variability in discrete semiconductor devices is due to the various types of interconnects used in a particular package style. For example, DO-7 packages with whisker/S-bend /C-bend construction exhibit intermittent failures when exposed to shock and vibration. Additionally, DO-35 packages with silver "button" construction exhibit intermittent and opens due to plastic deformation of the button. These are

nonscreenable failure modes and unfortunately the particular construction for each package style is not known and cannot be reported in the data contained in this databook.

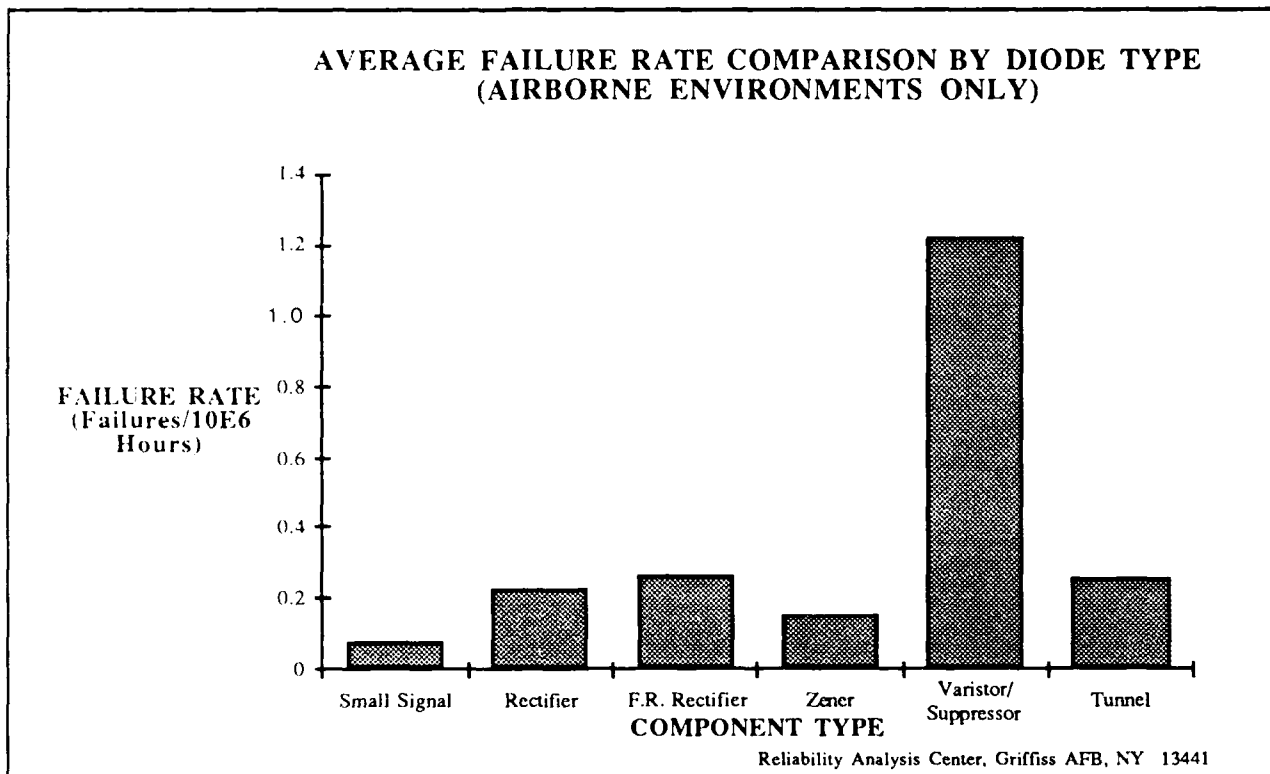


FIGURE 1: AVERAGE FAILURE RATE COMPARISON BY DIODE TYPE

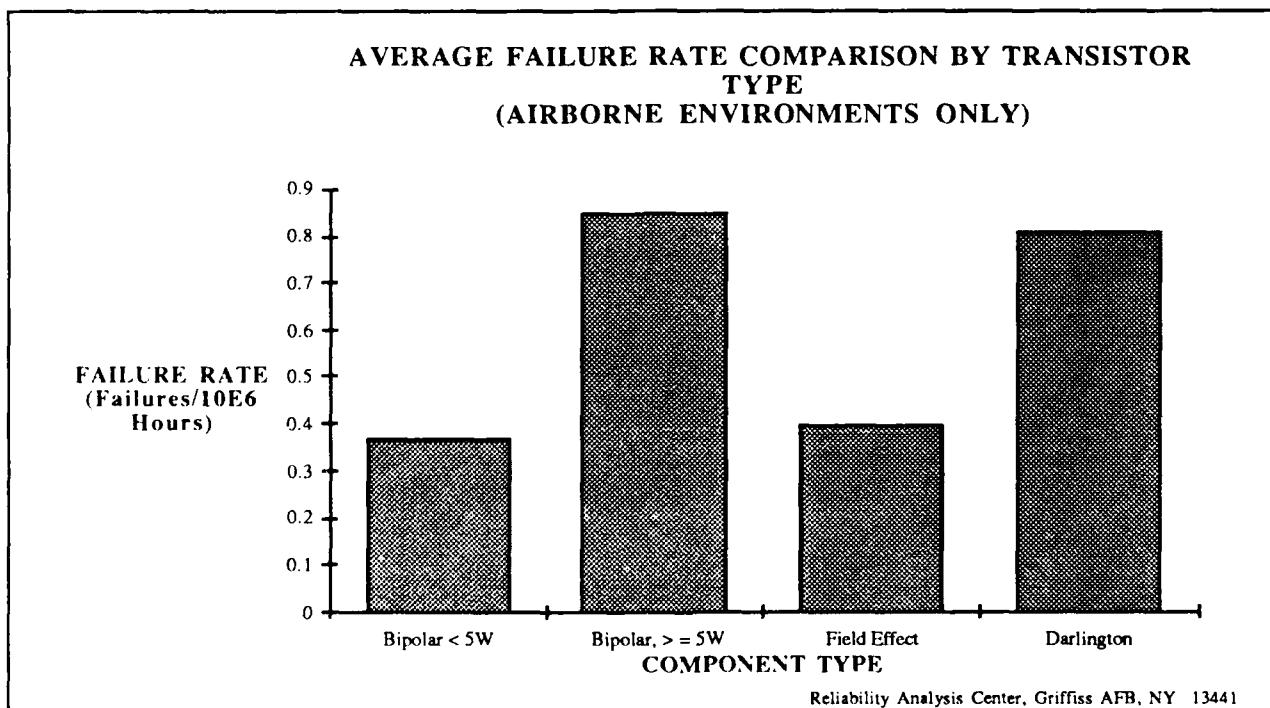


FIGURE 2: AVERAGE FAILURE RATE COMPARISON BY TRANSISTOR TYPE

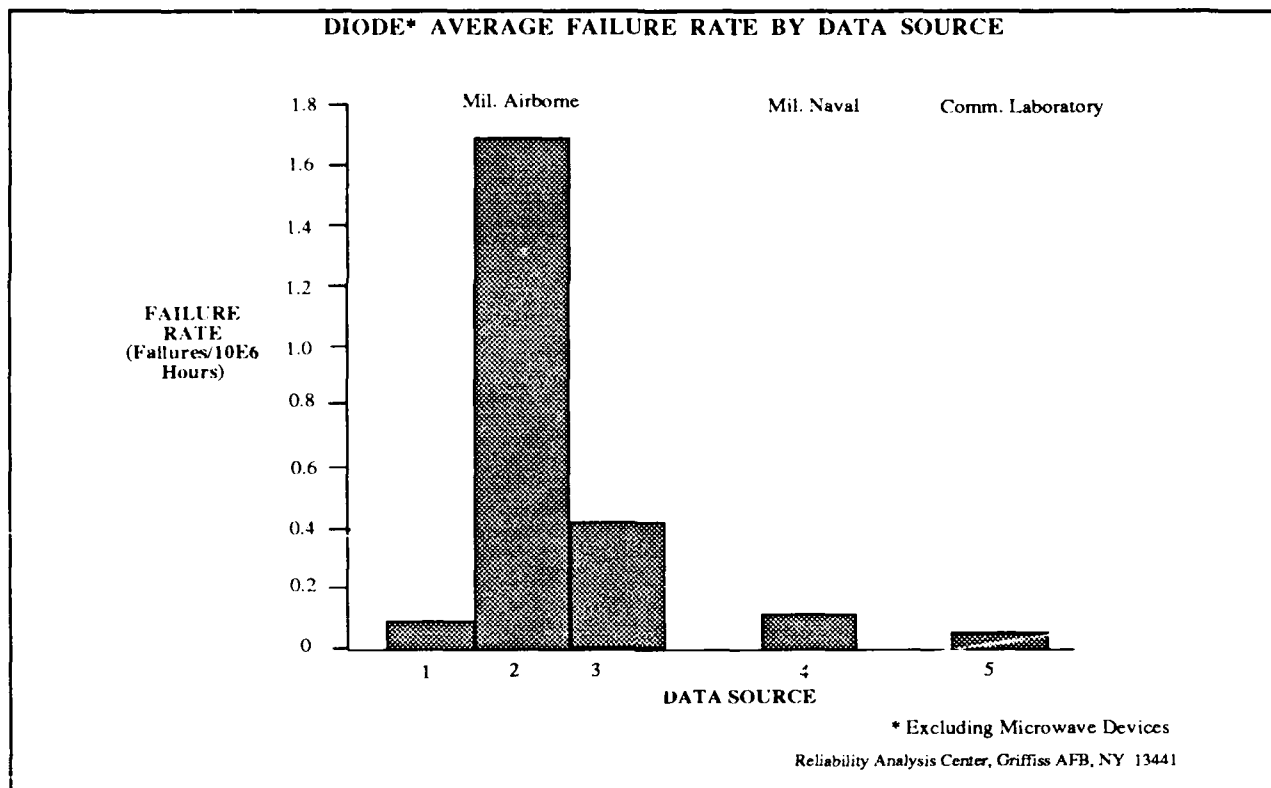


FIGURE 3: DIODE AVERAGE FAILURE RATE BY DATA SOURCE

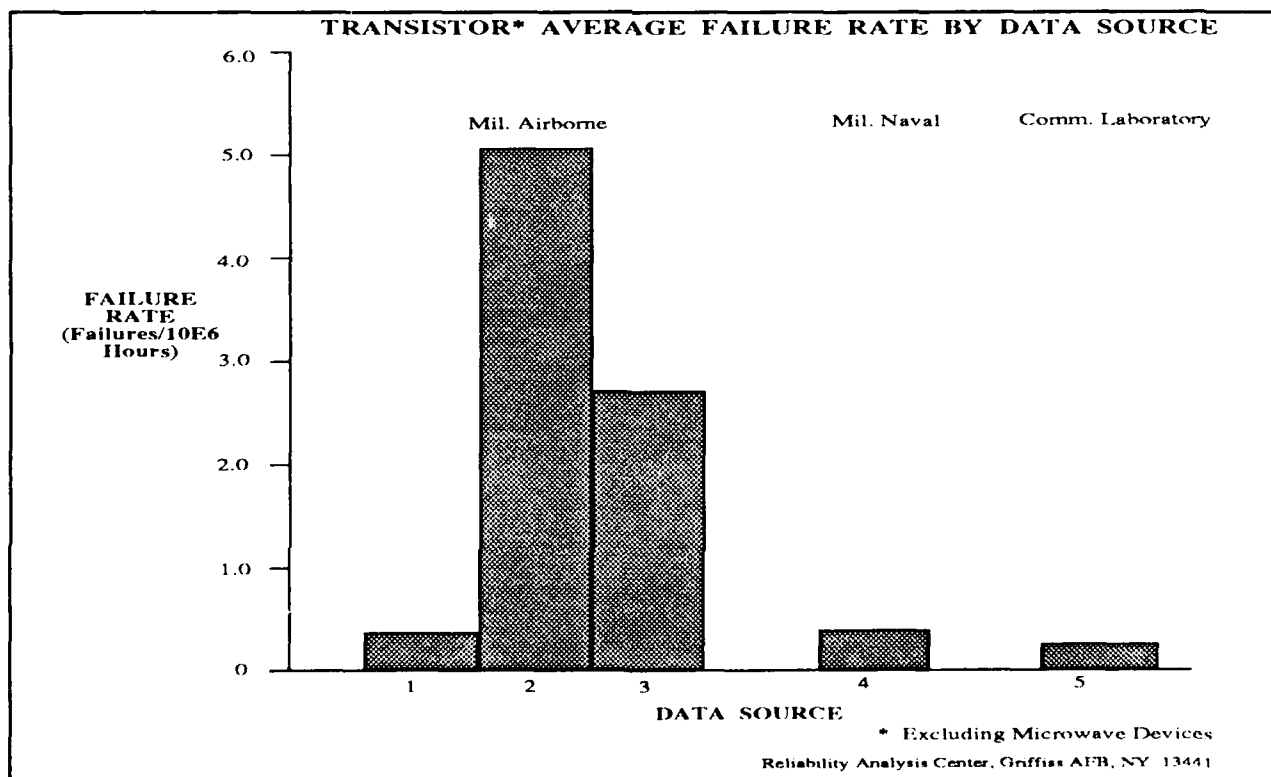


FIGURE 4: TRANSISTOR AVERAGE FAILURE RATE BY DATA SOURCE

2.2 VALIDITY OF THE EXPONENTIAL FAILURE ASSUMPTION

The primary purpose of failure rate prediction models for electronic components such as those in MIL-HDBK-217E is to estimate the reliability of electronic equipment and systems. Such failure rate prediction models are based upon the assumption of an exponential time-to-failure distribution, which assumes a constant failure rate over time.

However, most failure mechanisms of discrete semiconductor devices investigated in the literature reportedly follow a log-normal failure distribution. An investigation of such data was conducted to determine the validity of an exponential approximation in this light. The analysis presented in this section was performed by I.I.T. Research Institute under contract to Rome Air Development Center (contract number F30602-85-C-0131).

There are many practical reasons why the assumption of a constant failure rate is preferred to a time-dependent failure rate for MIL-HDBK-217E type failure rate prediction models.

- Simplicity

The mean time between failures (MTBF) of a system whose component parts exhibit constant failure rates is not time dependent. Alternatively, for a system made up of components having nonconstant failure rates, the system MTBF will be time-dependent and is therefore undefined unless a particular mission time is specified. The assumption of exponentiality allows for failure rates to be summed in a series reliability network.

- Precedent

The exponential assumption is currently used for the electronic components in accepted models such as those in MIL-HDBK-217E.

- Data Availability

If any distribution other than exponential is assumed, the parameters of the distribution must be determined by analysis of cumulative time-to-failure data. This detailed information is seldom available for field data sources. The exponential distribution allows population parameter estimates to be made based upon total part operating hours and total number of failures.

- Accuracy

When developing models such as those employed in MIL-HDBK-217E, any improvement in model accuracy resulting from the use of a more complex distribution (than exponential) may be insignificant when compared to the inherent variability associated with reliability prediction and the "statistical noise" in the data.

An analysis of constant versus time-dependent failure rate distributions was undertaken using observed time-to-failure data collected for this databook. However, due to the above-mentioned advantages, it was predetermined that if discrete semiconductor failure rate prediction models could be established as accurately with an exponential time-to-failure distribution as by a log-normal or other time dependent failure distribution, the former is preferable.

The following paragraphs describe the analysis procedure followed.

All time-to-failure data for discrete semiconductor components was extracted from the available literature. This data consisted of life test results at high temperatures. Ideally, it would

have been preferable to analyze time-to-failure field data since such data would more closely approximate the actual usage environments. However, such data is not available. High temperature life test time-to-failure data was available for the following device types:

Low Noise GaAs FETs
 High Power GaAs FETs
 General Purpose Transistors (NPN & PNP)
 GaAs Laser Diodes
 IMPATT Diodes
 Schottky Diodes

Weibull analysis was then applied. The Weibull distribution is particularly useful in analyzing life data since (1) it has repeatedly been observed to provide a good fit to the data, and (2) it is a flexible distribution which can approximate many other statistical distributions, depending upon the value of β , the shape parameter. Table 3 gives some shapes of the Weibull distribution which approximate other common distributions. The form of the Weibull distribution varies between texts, but a common one is given by the probability density function:

$$f(t) = \frac{\beta}{\alpha} \left(\frac{t}{\alpha}\right)^{\beta-1} \exp\left(-\left(\frac{t}{\alpha}\right)^{\beta}\right)$$

where

$f(t)$ = Weibull probability density function
 α = scale parameter (characteristic life)
 β = shape parameter
 t = time

TABLE 3: WEIBULL SHAPE PARAMETERS (REFERENCE 1)

<u>Shape Parameter, β</u>	<u>Distribution Type</u>
$\beta < 1$	Gamma ($k < 1$)
$\beta = 1$	Exponential
$\beta = 2$	Rayleigh
$\beta = 3.44$	Normal (approx.)

Twenty-one individual data sets were plotted on Weibull probability paper, and the value of β was determined. Figures 5 through 25 illustrates the Weibull plots of the data. The results of this step of the analysis were encouraging since, as can be seen from the plots, the values of β seemed to center around 1.0. Table 4 presents of a summary of the best fit Weibull parameters.

The next step of the analysis was to force the best line with $\beta = 1.0$ through the observed data points. This is also illustrated in the figures. The Kolmogorov-Smirnov (K-S) goodness-of-fit test was then applied to the forced line. The intent of this step was to determine the degree of error resulting from the exponential assumption. To apply the test, the value of the D statistic, the largest deviation of observed from expected or theoretical value is compared to standard tables of critical values at some predetermined level of significance (in this case 0.2). If D exceeds the critical value, it can be concluded that the observations do not fit the theoretical distribution.

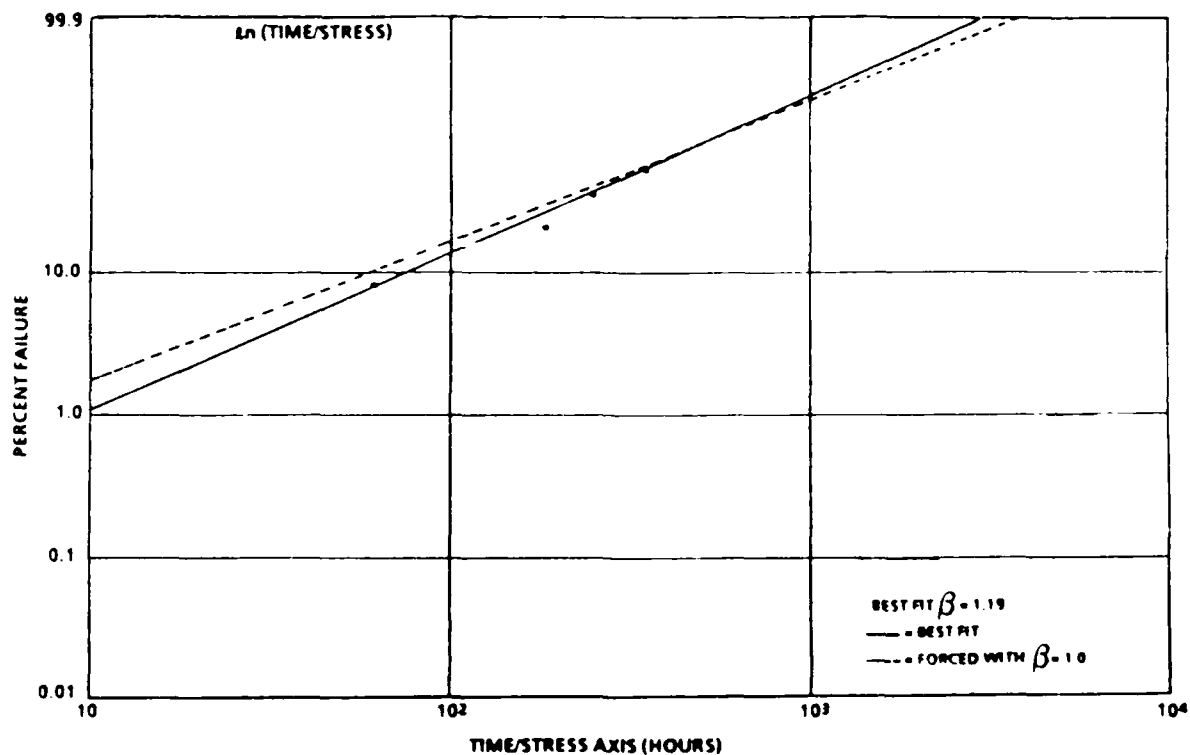


FIGURE 5: WEIBULL PLOT OF HIGH TEMPERATURE OPERATING LIFE DATA FOR GaAs FETs

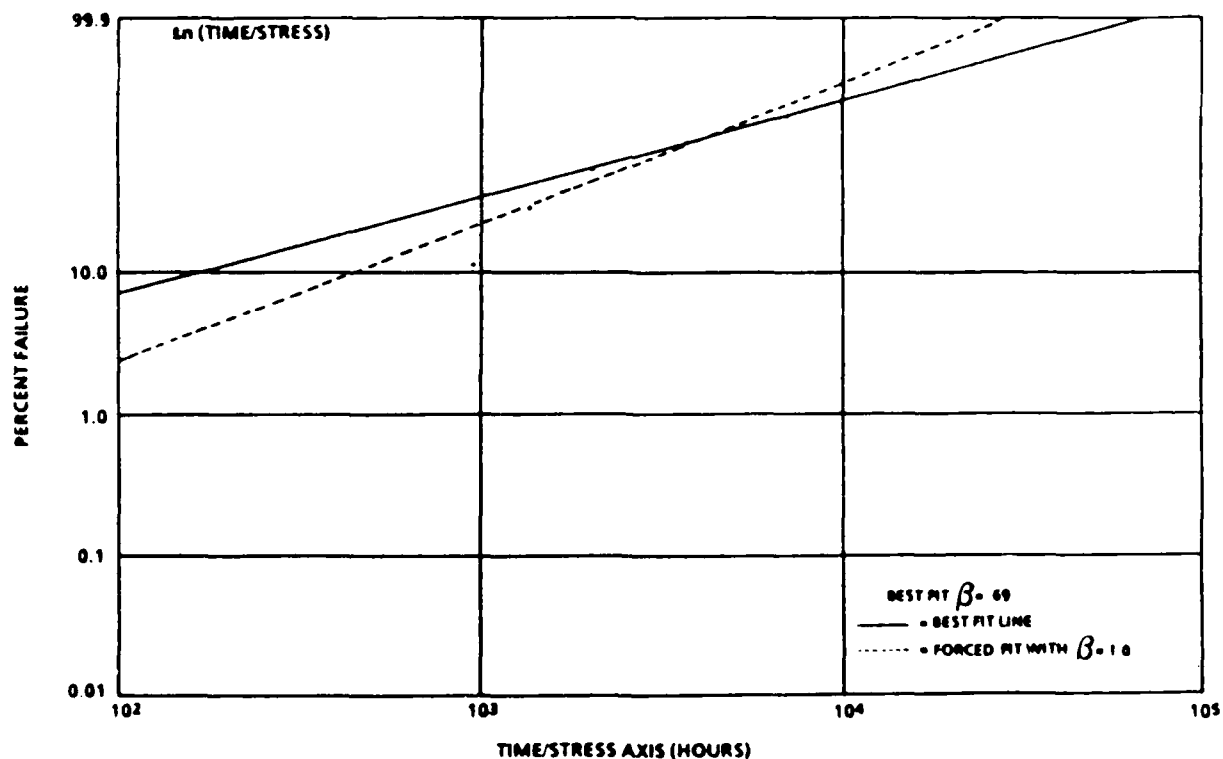


FIGURE 6: WEIBULL PLOT OF HIGH TEMPERATURE OPERATING LIFE DATA FOR GaAs LASER DIODES

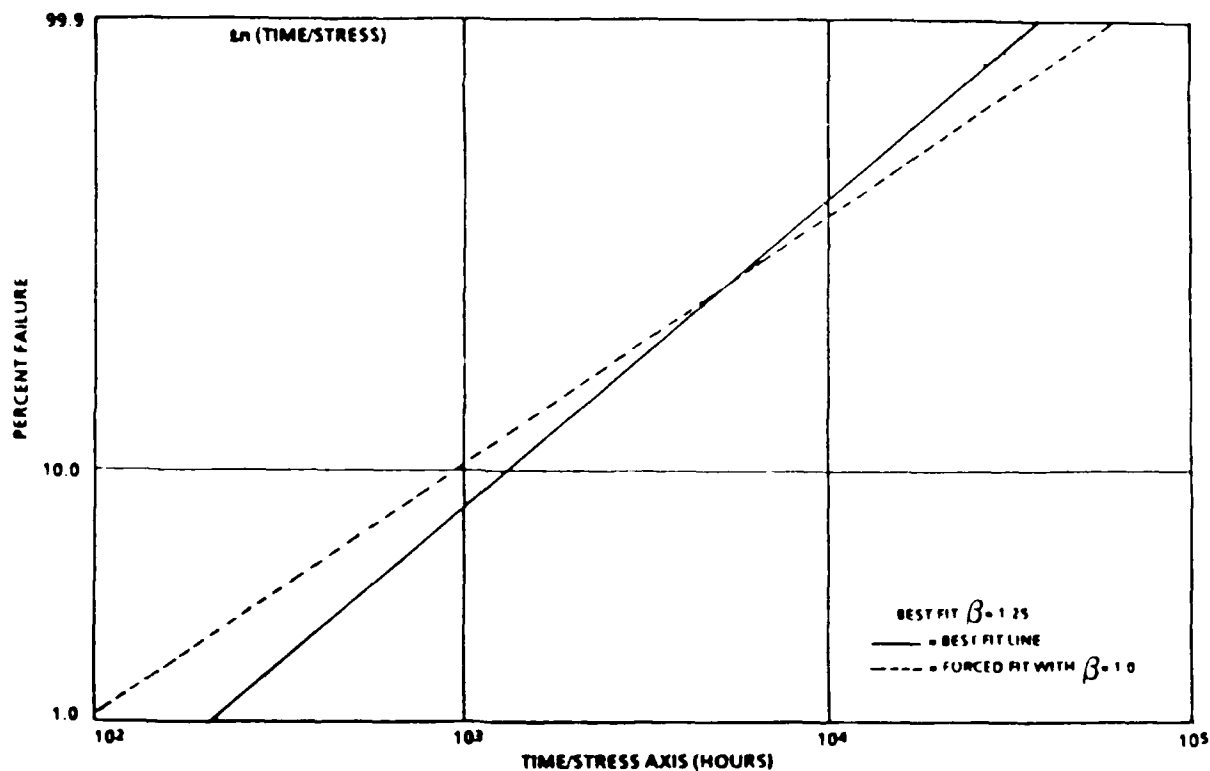


FIGURE 7: WEIBULL PLOT OF HIGH TEMPERATURE OPERATING LIFE DATA FOR GaAs LASER DIODES

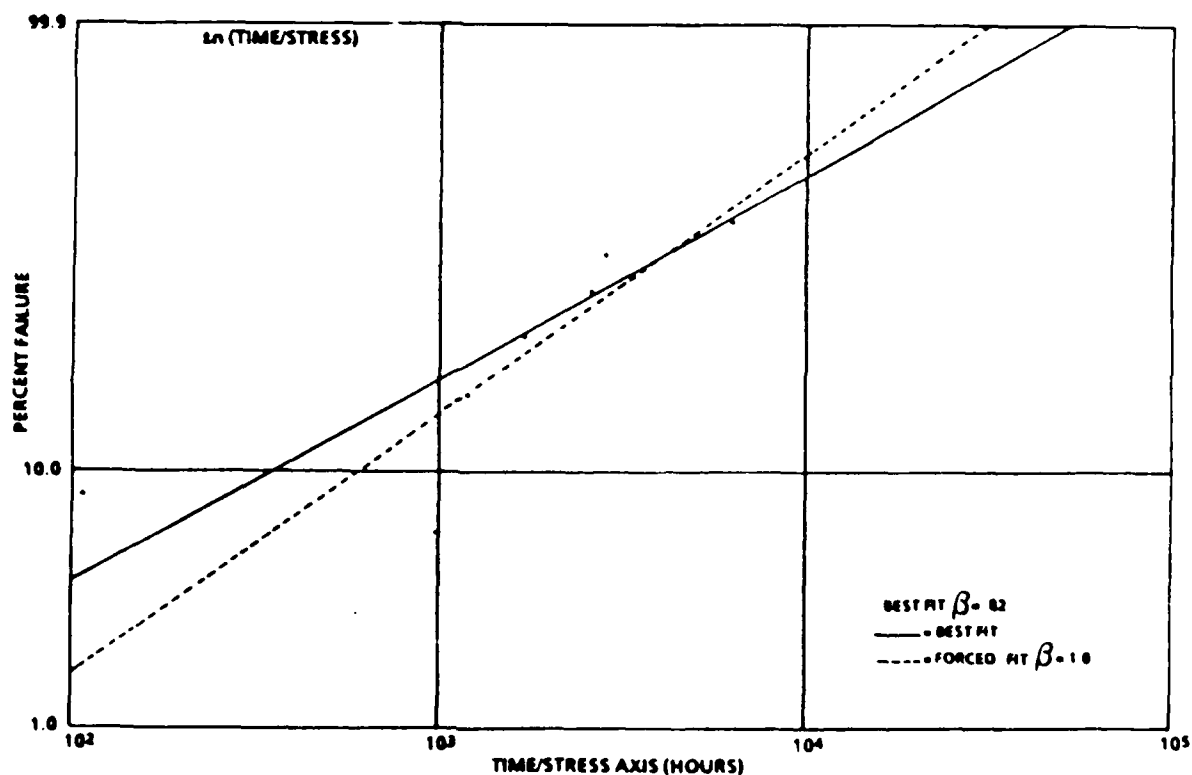


FIGURE 8: WEIBULL PLOT OF HIGH TEMPERATURE OPERATING LIFE DATA FOR GaAs LASER DIODES

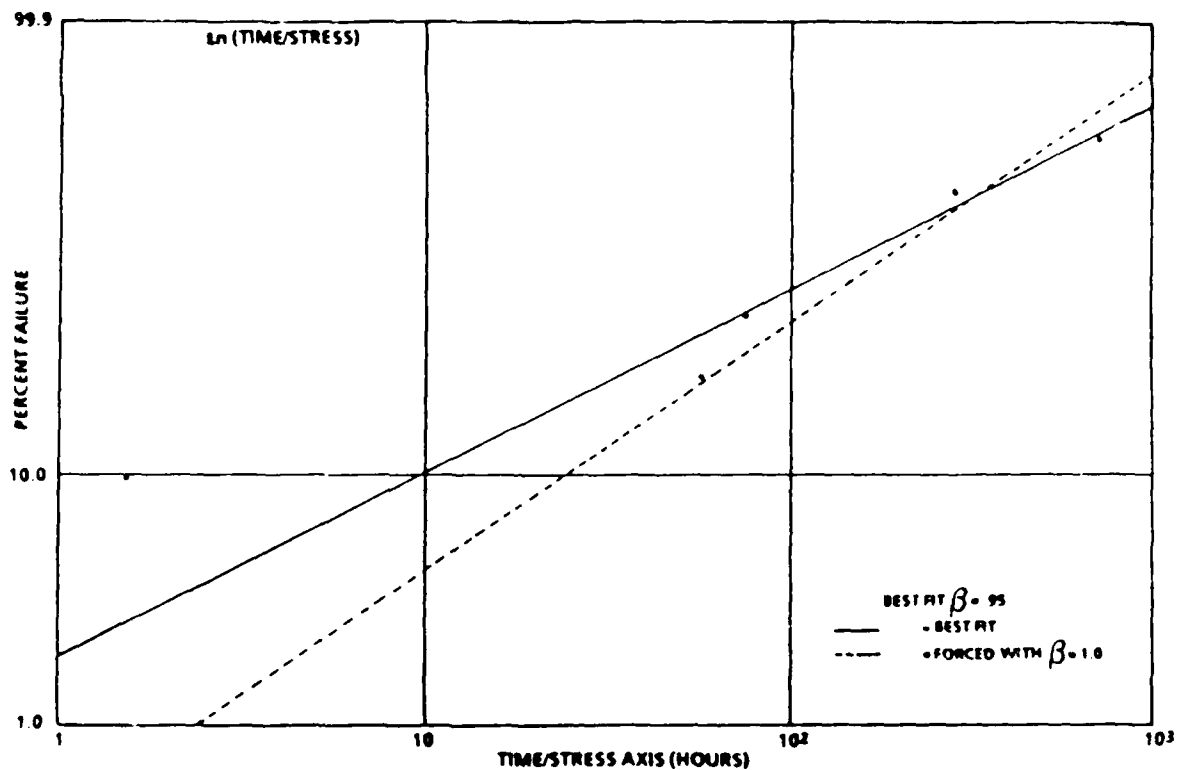


FIGURE 9: WEIBULL PLOT OF HIGH TEMPERATURE OPERATING LIFE DATA FOR GaAs LASER DIODES

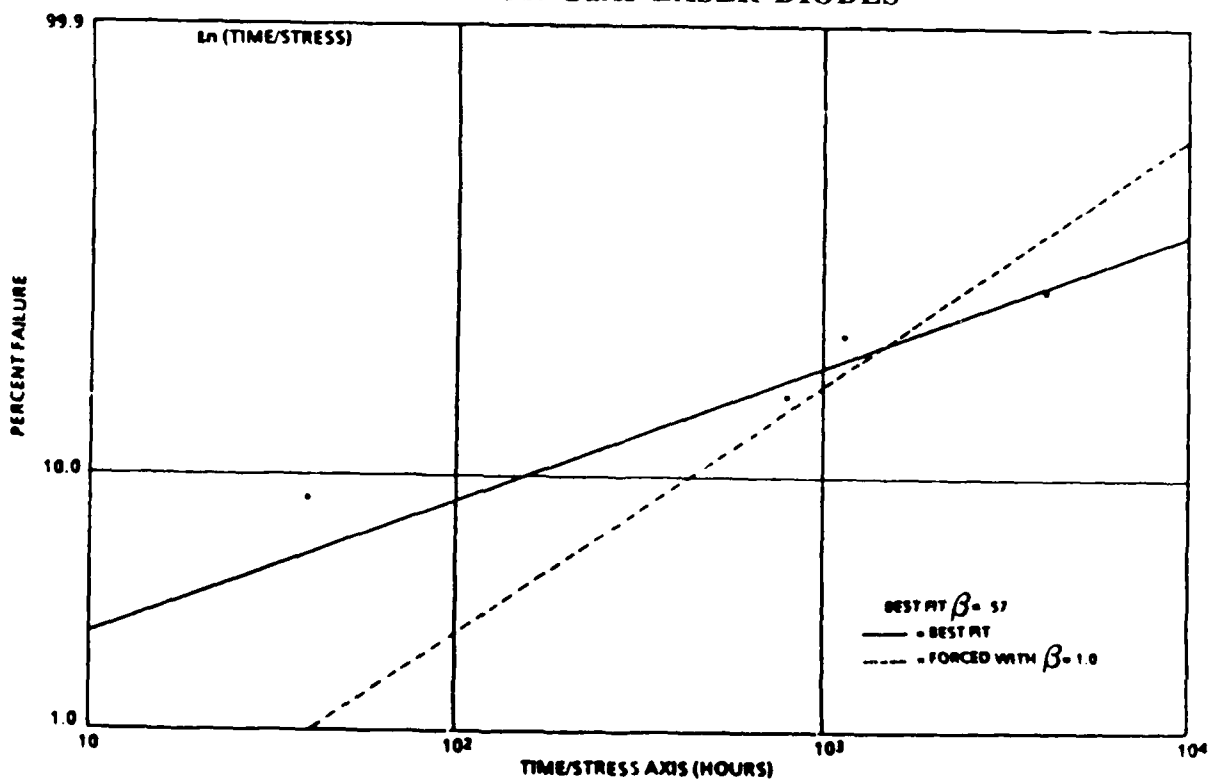


FIGURE 10: WEIBULL PLOT OF HIGH TEMPERATURE OPERATING LIFE DATA FOR GaAs LASER DIODES

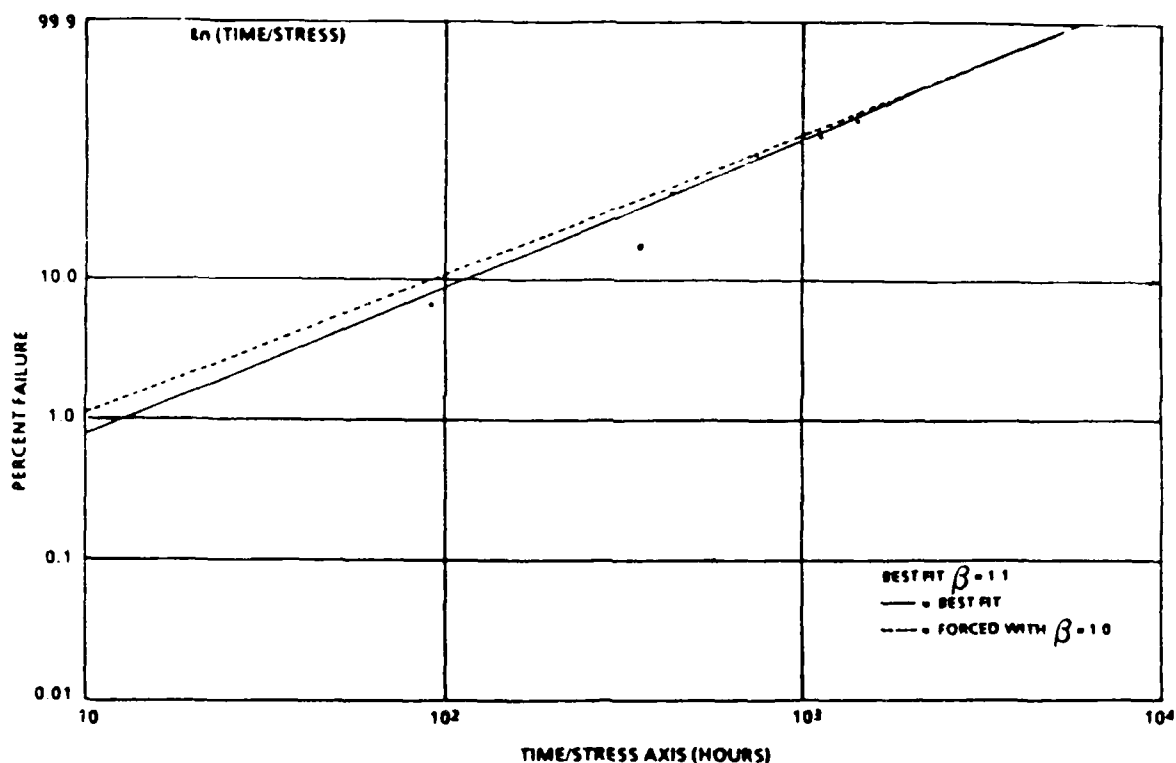


FIGURE 11: WEIBULL PLOT OF HIGH TEMPERATURE OPERATING LIFE DATA FOR GaAs FETs

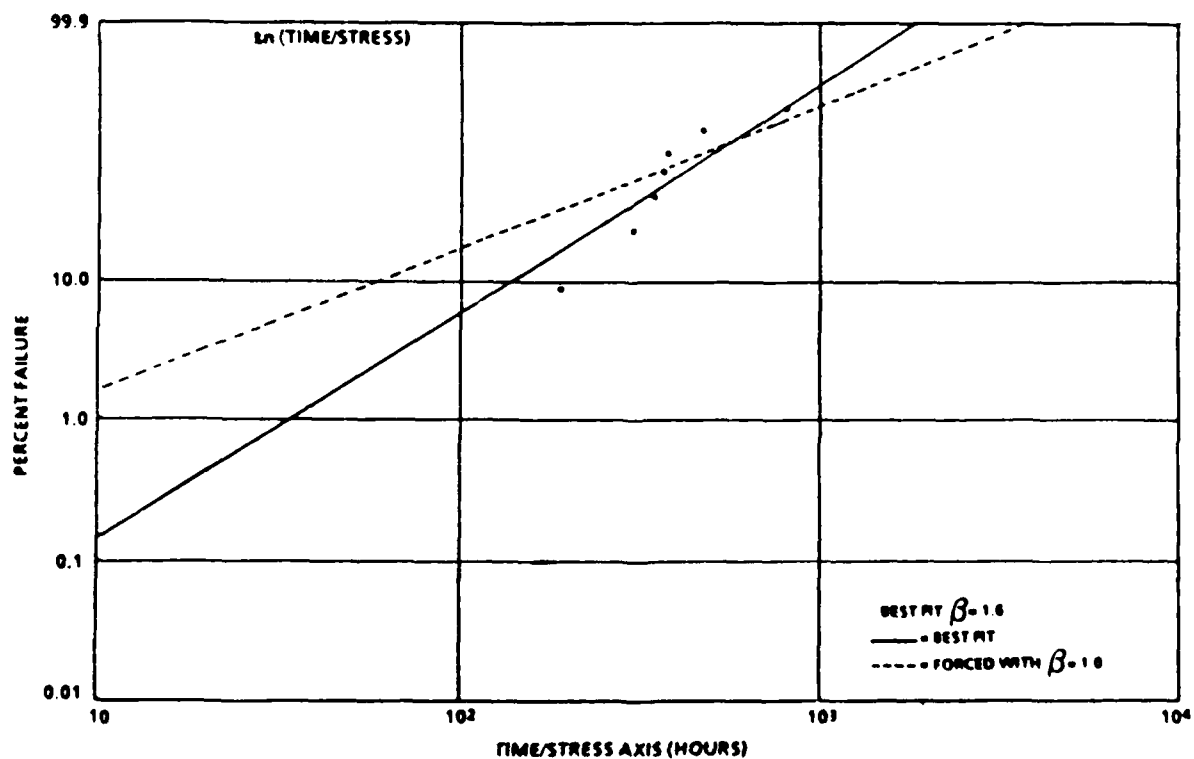


FIGURE 12: WEIBULL PLOT OF HIGH TEMPERATURE OPERATING LIFE DATA FOR GaAs FETs

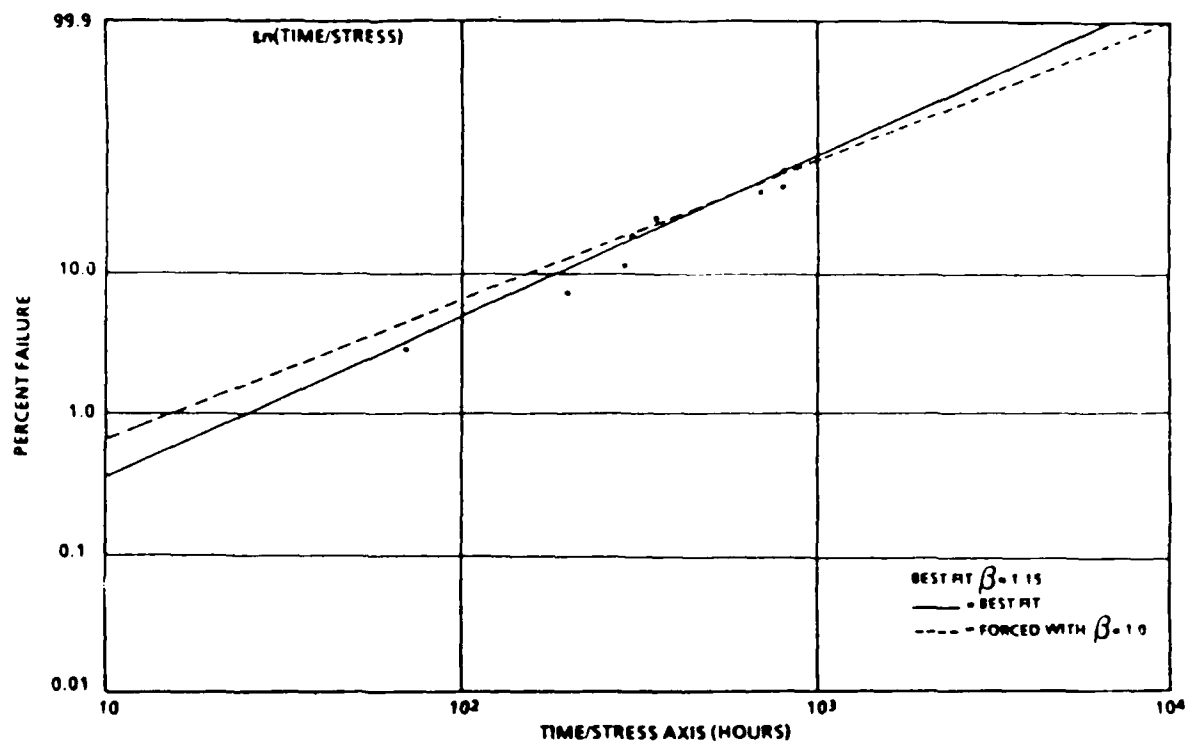


FIGURE 13: WEIBULL PLOT OF HIGH TEMPERATURE OPERATING LIFE DATA FOR HIGH POWER PULSED IMPATT DIODES

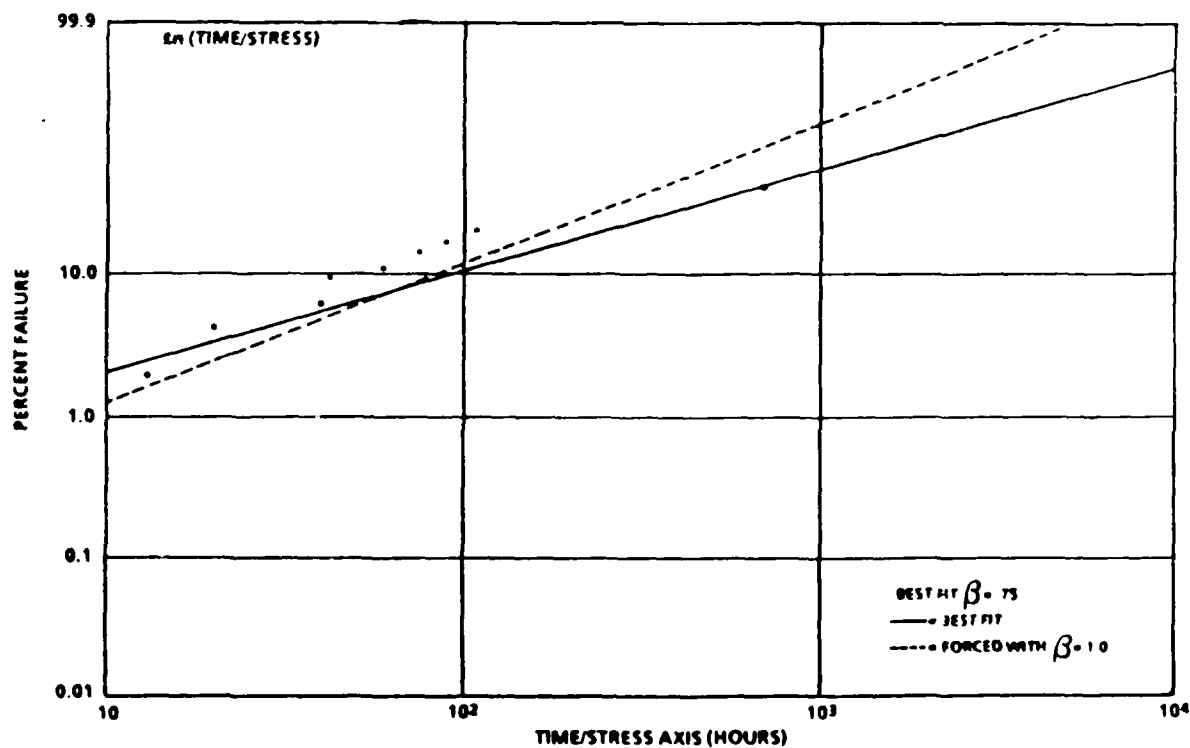


FIGURE 14: WEIBULL PLOT OF HIGH TEMPERATURE OPERATING LIFE DATA FOR HIGH POWER PULSED IMPATT DIODES

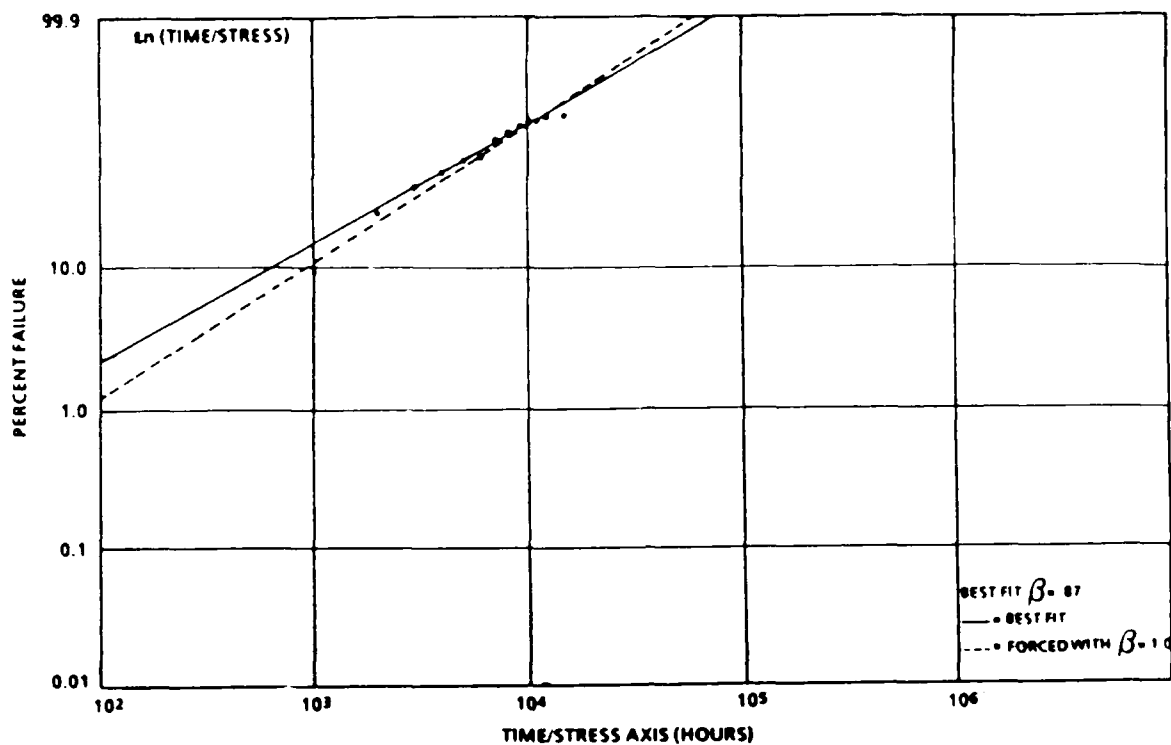


FIGURE 15: WEIBULL PLOT OF HIGH TEMPERATURE OPERATING LIFE DATA FOR (AlGa) AS LASERS

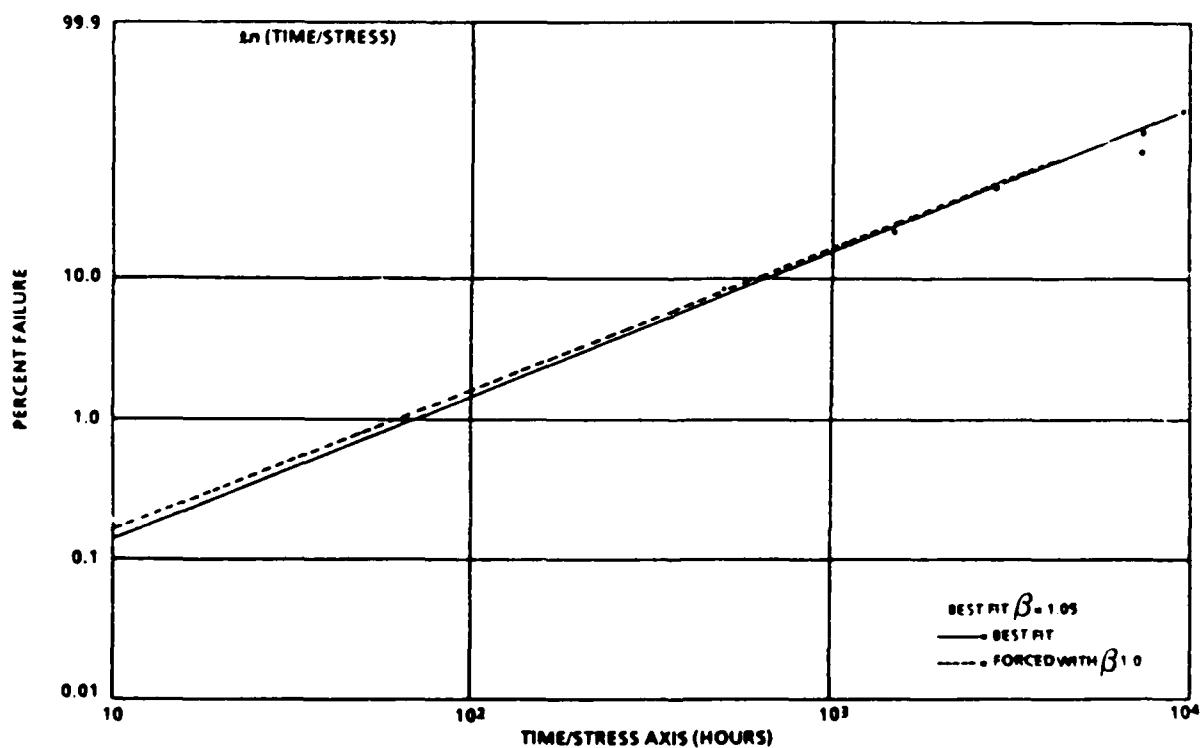


FIGURE 16: WEIBULL PLOT OF HIGH TEMPERATURE OPERATING LIFE DATA FOR IN GaAs P/In P DH LASERS

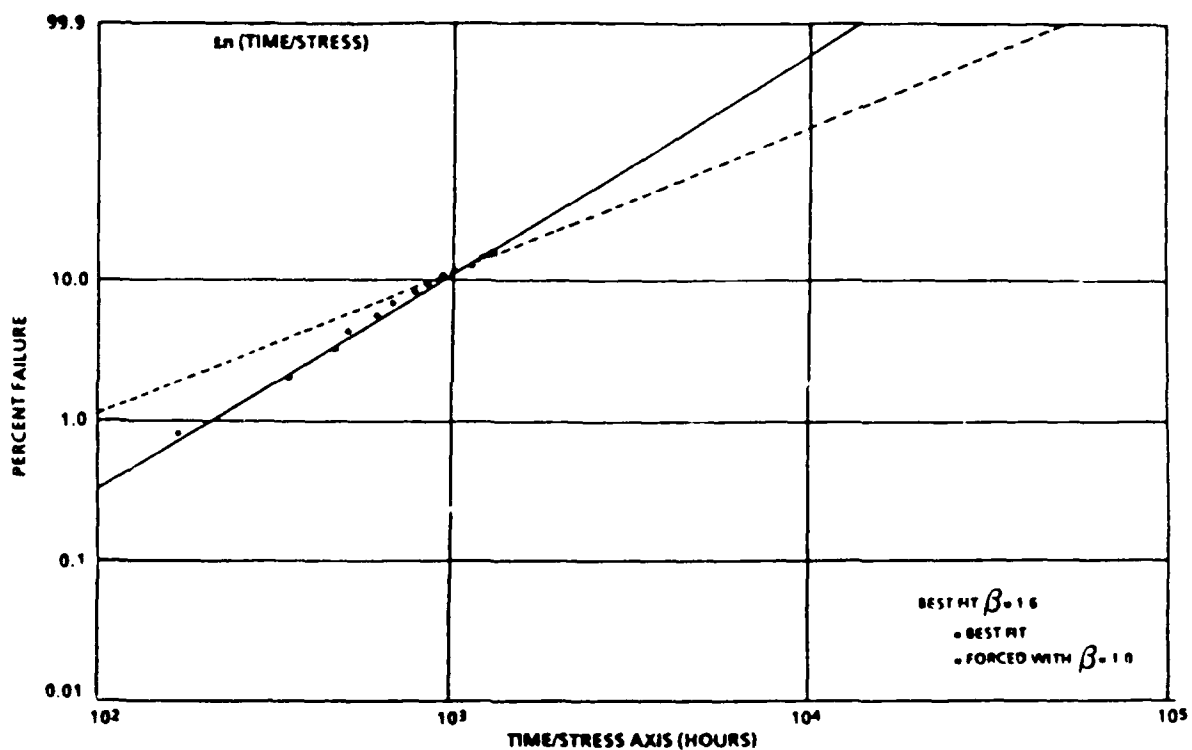


FIGURE 17: WEIBULL PLOT OF HIGH TEMPERATURE OPERATING LIFE DATA FOR JAN 2N918

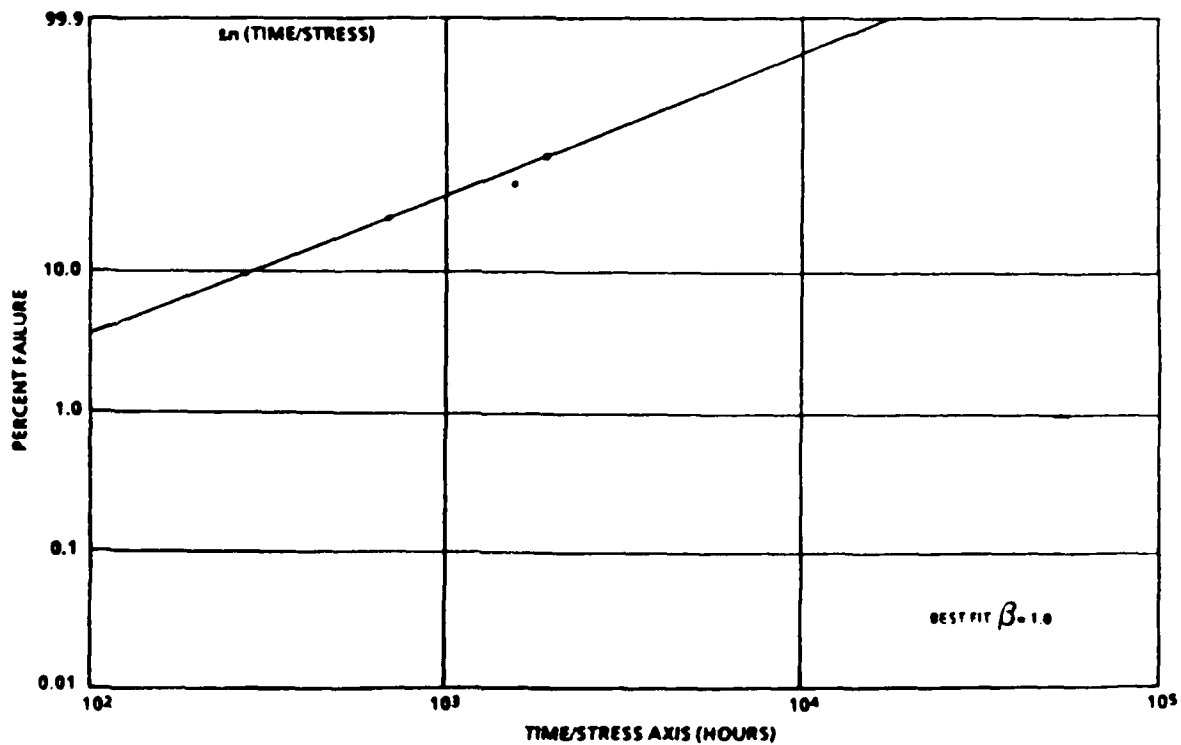


FIGURE 18: WEIBULL PLOT OF HIGH TEMPERATURE OPERATING LIFE DATA FOR GaAs POWER FETs

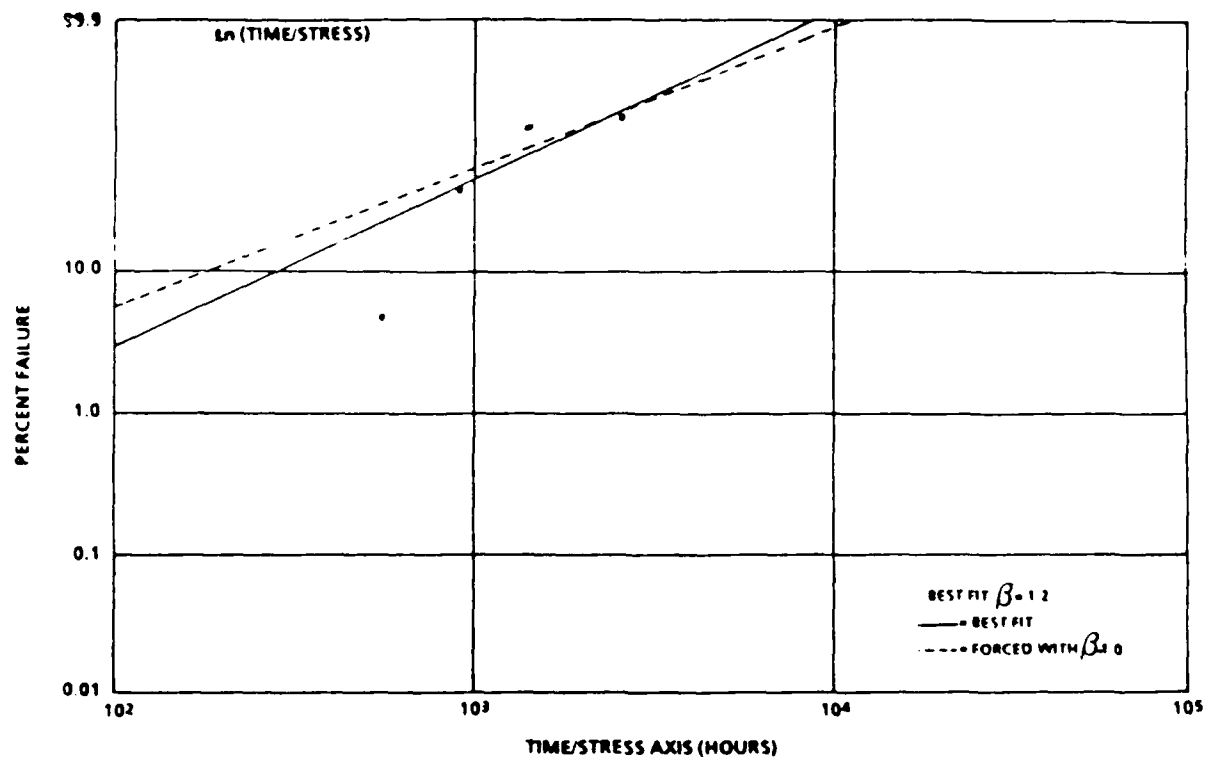


FIGURE 19: WEIBULL PLOT OF HIGH TEMPERATURE OPERATING LIFE DATA FOR LOW NOISE GaAs FETs

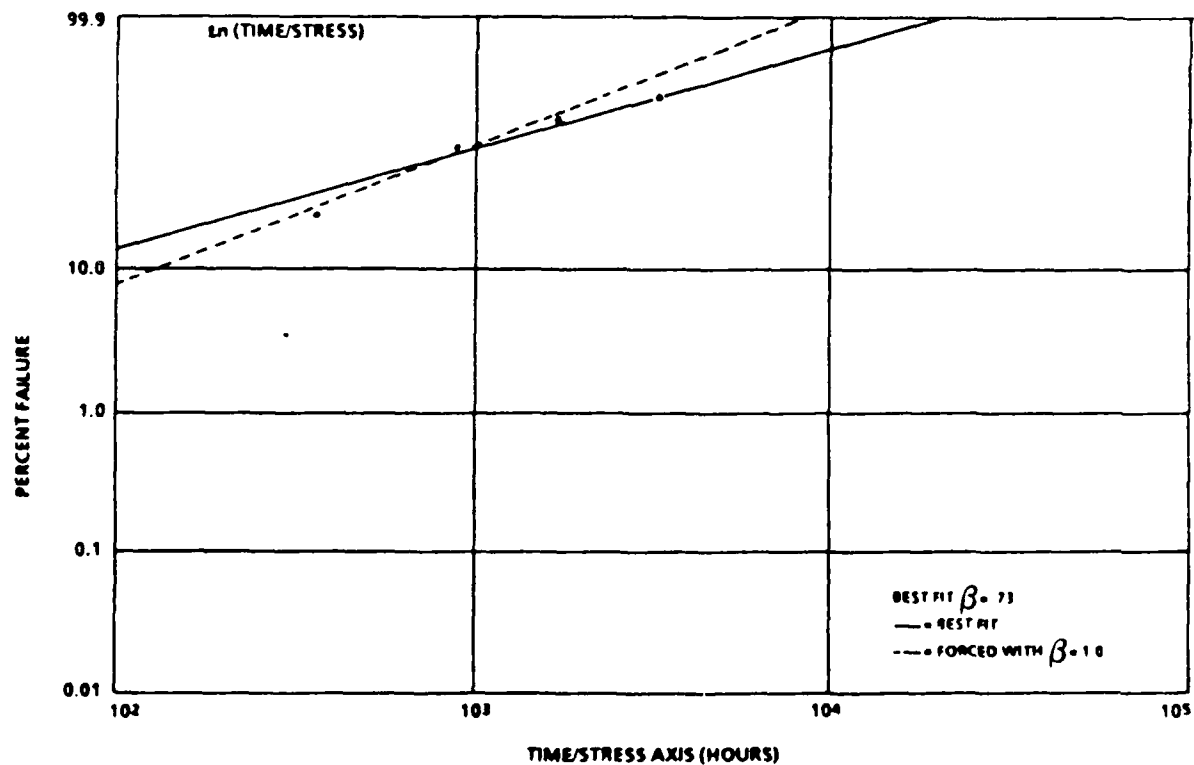


FIGURE 20: WEIBULL PLOT OF HIGH TEMPERATURE OPERATING LIFE DATA FOR LOW NOISE GaAs FETs

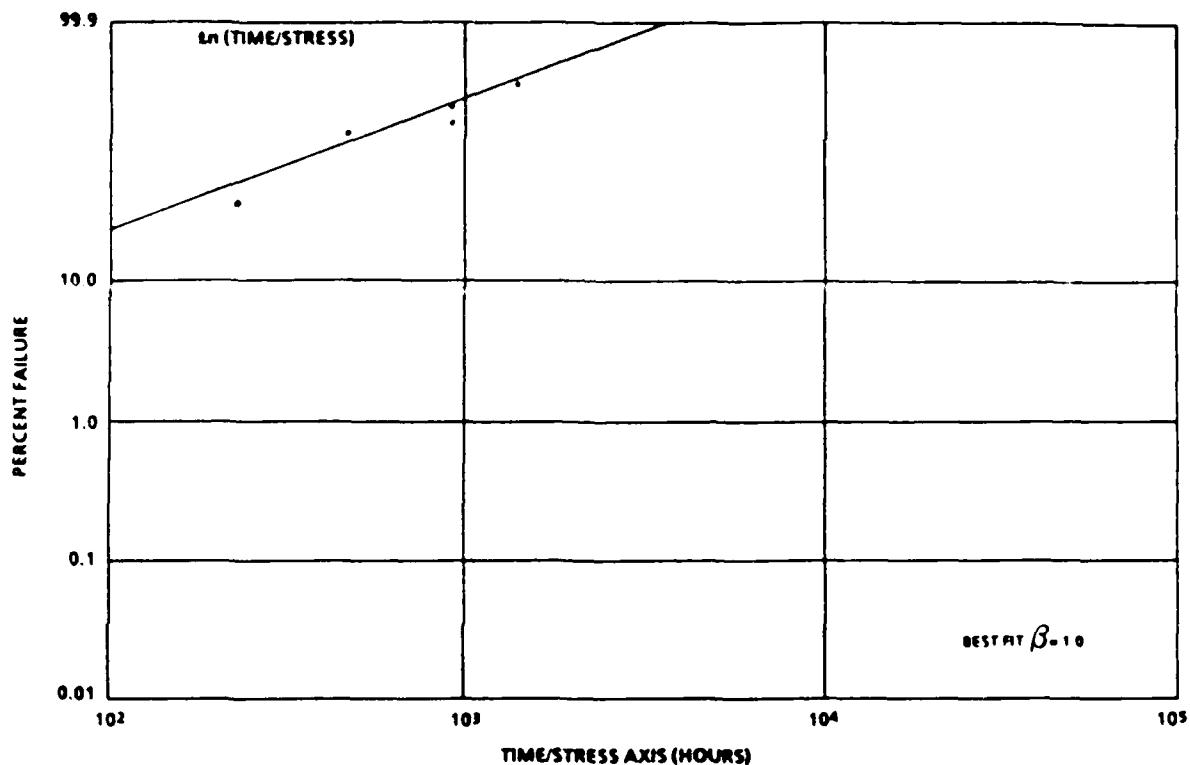


FIGURE 21: WEIBULL PLOT OF HIGH TEMPERATURE OPERATING LIFE DATA FOR LOW NOISE GaAs FETs

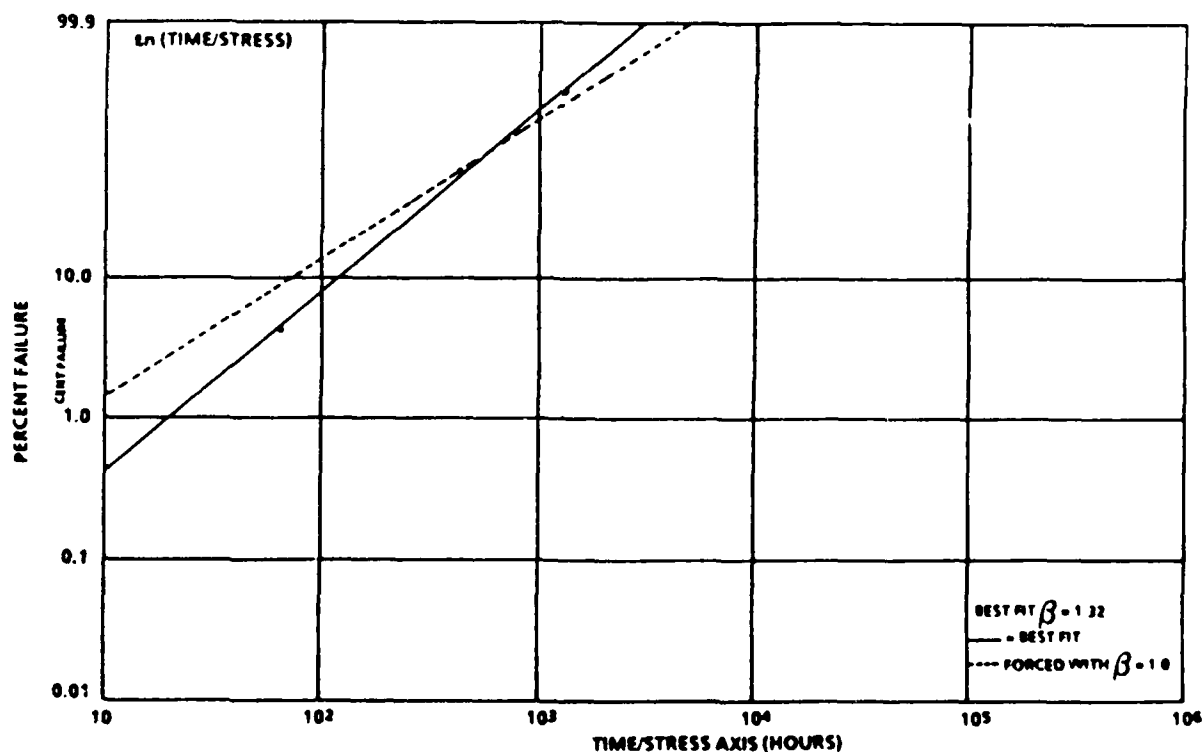


FIGURE 22: WEIBULL PLOT OF HIGH TEMPERATURE OPERATING LIFE DATA FOR LOW NOISE GaAs FETs

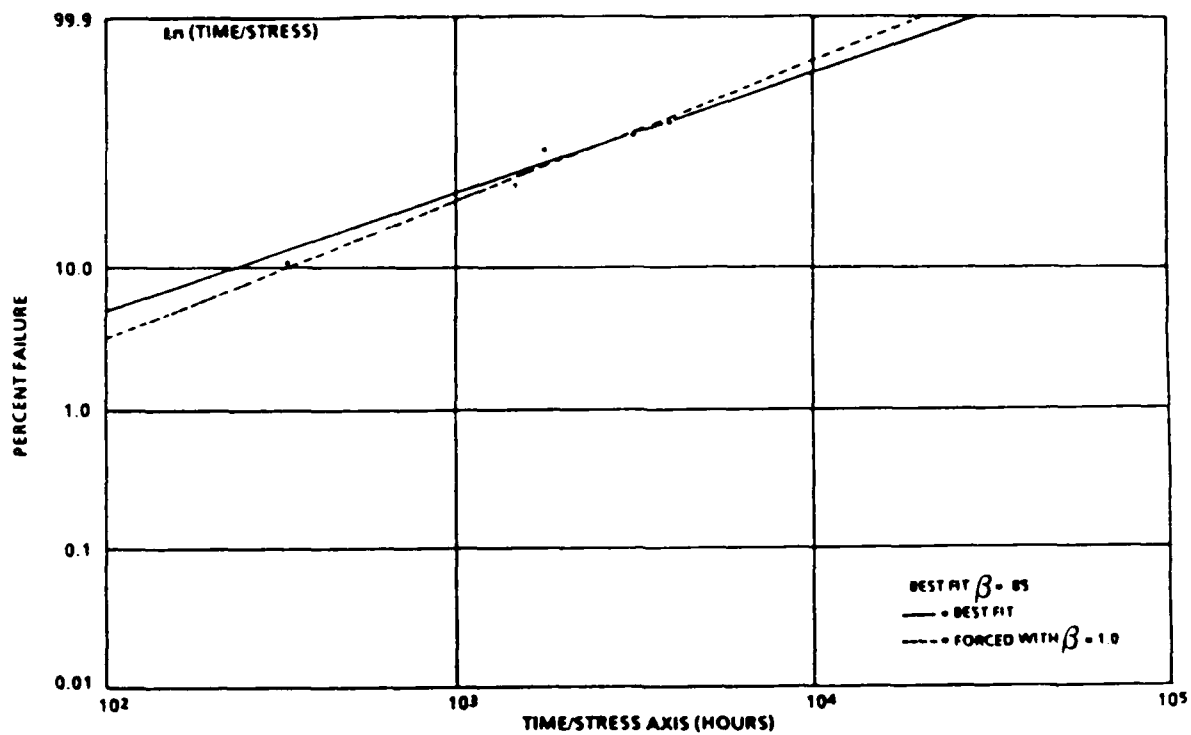


FIGURE 23: WEIBULL PLOT OF HIGH TEMPERATURE OPERATING LIFE DATA FOR LOW NOISE GaAs FETs

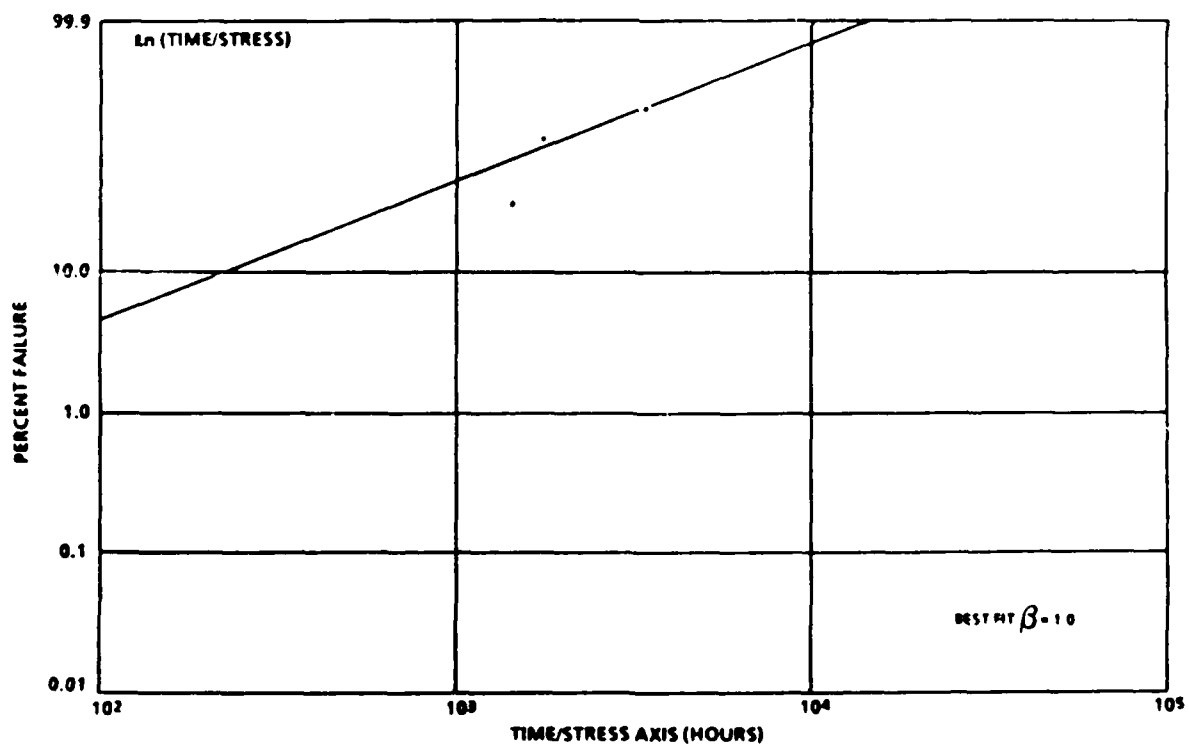


FIGURE 24: WEIBULL PLOT OF HIGH TEMPERATURE OPERATING LIFE DATA FOR LOW NOISE GaAs FETs

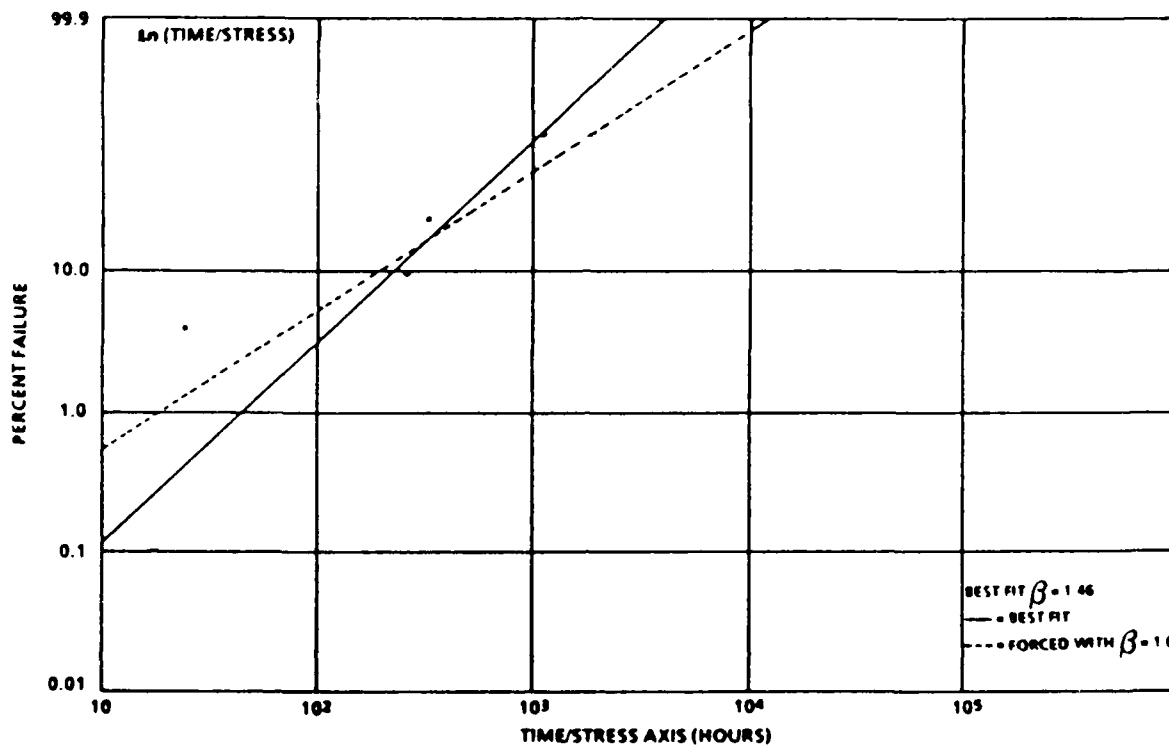


FIGURE 25: WEIBULL PLOT OF HIGH TEMPERATURE OPERATING LIFE DATA FOR LOW NOISE GaAs FETs

Otherwise, it can be assumed that the observed distribution is not significantly different from the exponential model. None of the data sets was significantly different from the exponential model at 20% significance. This implies that the available data does not indicate deficiencies with the exponential assumption. The results of the Kolmogorov-Smirnov test (KS) are presented in Table 5.

TABLE 4: OBSERVED WEIBULL PARAMETERS

<u>Figure #</u>	<u>Ref #</u>	<u>Temperature (°C)⁽¹⁾</u>	<u>β</u>	<u>α</u>
5	2	200 (Tc)	1.15	600
6	3	70 (Tc)	.69	4,400
7	3	55 (Tc)	1.25	8,000
8	3	70 (Tc)	.82	5,200
9	3	70 (Tc)	.95	230
10	3	70 (Tc)	.57	10,000
11	4	245 (Tc)	1.10	950
12	4	231 (Ta)	1.60	580
13	5	90 (Tc) 220 (Tj)	1.15	1,300
14	5	90 (Tc) 220 (Tj)	.75	2,000
15	6	70 (Ta)	.87	8,000
16	7	20 (Tc)	1.05	6,000
17	8	300 (Tj)	1.60	4,000
18	9	228 (Tj)	1.00	2,700
19	10	200 (Ta)	1.20	1,600
20	10	200 (Ta)	.73	1,500
21	10	220 (Ta)	1.00	500
22	10	220 (Ta)	1.32	700
23	10	85 (Ta)	.85	3,100
24	10	120 (Ta)	1.00	2,100
25	10	240 (Ta)	1.46	1,200

NOTES: (1) Tc = case temperature

Ta = ambient temperature

Tj = junction temperature

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TABLE 5: D STATISTIC TEST RESULTS

<u>Figure #</u>	<u>Ref. #</u>	<u># of Failures</u>	<u>Maximum Deviation</u>	<u>D Statistic (0.2 Significance Level)</u>	<u>Conclusion</u>
5	2	4	.022	.494	Fits $\beta = 1.0$
6	3	5	.078	.446	Fits $\beta = 1.0$
7	3	5	.054	.446	Fits $\beta = 1.0$
8	3	6	.200	.410	Fits $\beta = 1.0$
9	3	7	.083	.381	Fits $\beta = 1.0$
10	3	4	.116	.494	Fits $\beta = 1.0$
11	4	9	.090	.339	Fits $\beta = 1.0$
12	4	7	.227	.381	Fits $\beta = 1.0$
13	5	11	.055	.323	Fits $\beta = 1.0$
14	5	15	.231	.276	Fits $\beta = 1.0$
15	6	74	.118	.124	Fits $\beta = 1.0$
16	7	7	.140	.381	Fits $\beta = 1.0$
17	8	13	.025	.297	Fits $\beta = 1.0$
18	9	4	.080	.494	Fits $\beta = 1.0$
19	10	11	.250	.323	Fits $\beta = 1.0$
20	10	13	.040	.297	Fits $\beta = 1.0$
21	10	15	.090	.276	Fits $\beta = 1.0$
22	10	14	.060	.274	Fits $\beta = 1.0$
23	10	11	.090	.323	Fits $\beta = 1.0$
24	10	16	.190	.258	Fits $\beta = 1.0$
25	10	10	.250	.322	Fits $\beta = 1.0$

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Based on the results of the K-S test, it was assumed that the failure distributions of the semiconductor devices analyzed could be described by a Weibull distribution with a slope of 1.0. Assuming anything other than a constant failure rate would introduce unnecessary complexity into the prediction models. The observed time-to-failure distributions were accurately represented by an exponential distribution over the range of variables in the data. Additionally, as many different time-dependent failure mechanism distributions are summed (since a device can be susceptible to several failure mechanisms at one time) an exponential distribution often results.

Time-to-failure data was not available for all discrete semiconductor device types. It was therefore reasonable to assume that the times-to-failure of other discrete semiconductor part types would follow the same distribution. There was no evidence in the literature that any discrete semiconductor part types should differ from those with available times-to-failure. Furthermore, the part types analyzed represent a diverse cross-section of all part types, since they include both Field Effect and Bipolar devices and members from the transistor, diode, and optoelectronic groups.

2.3 DSR-3/DSR-4 DATA COMPARISON

Significant design and processing technology advances have been made over the past 10-15 years in the semiconductor industry. To examine the influence of these changes on semiconductor device failure rates, the data in this publication was compared with data from similar applications and part types in DSR-3, its predecessor. The results of this comparison are presented in Table 6. Overall there seems to be a general improvement in observed failure rates. The three cases where DSR-4 failure rates are worse than the corresponding DSR-3 number represent part types for which the failure rate should probably have stabilized and the result is simply a statistical aberration. Of particular interest is the DSR-3 to DSR-4 commercial device data comparison, since these values are from the same data sources thereby negating some of the variations due to data collecting practice, and application-related effects.

Table 6: DSR-3* vs. DSR-4 Component Failure Rate
(failures/10⁶ hours) Comparison**

Device Type	DSR-3 Airborne	DSR-4 Airborne	Ratio	DSR-3 Commercial	DSR-4 Commercial	Ratio
DIODE						
Small Signal Switching	0.046	0.085	0.53	0.038	---	---
Rectifier	5.833	0.2127	27.41	0.1165	0.056	2.06
Rectifier, Fast Recovery	0.4629	0.2671	1.73	---	---	---
Zener	1.4905	0.1433	10.32	0.1772	0.123	1.43
Current Regulator	---	---	---	---	0.147	---
Varistor/Suppressor	34.4827	1.2225	28.30	---	---	---
Tunnel	---	0.2511	---	---	0.207	---
Varactor	---	---	---	0.0886	0.235	0.37
TRANSISTOR						
Bipolar, < 5W	2.6001	0.3771	6.89	0.2234	0.092	2.40
Bipolar, >=5	11.9134	0.8475	14.05	0.7242	0.272	2.66
Field Effect	8.9285	0.3953	22.58	0.4714	0.189	2.49
Unijunction	---	---	---	0.3831	0.307	1.24
Darlington	---	0.8120	---	0.2657	---	---
THYRISTOR	1.2432	4.6824	0.26	0.6007	0.175	3.41
OPTOELECTRONIC						
LED	---	---	---	0.1656	0.003	46.09
<p>* DATA VINTAGE 1968-1978 ** DATA VINTAGE 1976-1987 --- INSUFFICIENT DATA</p>						

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2.4 DERATING EFFECTS

The benefits of electrical parameter derating on discrete semiconductor device reliability have been well documented (Ref. 11, 12). Since data collected on the ARN-118 was complemented with a detailed MIL-HDBK-217 part stress analysis performed on that same equipment, electrical stress levels were available for bipolar transistors and diodes. The knowledge of electrical stress levels combined with detailed part-level failure experience data facilitated the analysis of V_{CE} derating for bipolar transistors and V_R derating for small signal and rectifier diodes.

The analysis was performed by linear regression of failure rate against voltage stress. Transformations were performed on the failure rate and stress variables to provide results in one of two forms:

$$\text{Failure rate} \propto \exp(a_1 V_S)$$

or

$$\text{Failure rate} \propto (V_S)^{a_2}$$

where a_1 and a_2 are regression constants and V_S is the applied voltage stress level. The form with the best R^2 value for each device type would be determined from the analysis. The effects of temperature and environment, which are not the same for all data within the ARN-118 dataset since it is from several aircrafts, were normalized out assuming current MIL-HDBK-217E factors to be correct.

Voltage stress indeed proved to have a significant effect on failure rate for high power (>5W) bipolar transistors. This effect was not evident in the low power bipolar transistor data collected. However, from a theoretical perspective, derating should also benefit low power devices. Most likely, the comparatively lower failure rates and the associated higher failure rate variability in the data prevented the confirmation of such a factor. A relationship between voltage stress and failure rate is also evident in the data for signal and rectifier diodes.

The results of the regression analysis for transistors is:

$$\text{Failure rate} \propto \exp(3.1 V_S) \quad R^2 = .40 \quad [0 < V_S \leq 1.0]$$

where V_S is V_{CE}/V_{CE0} . The lower and upper 95% confidence interval values about " a_1 " are 1.72 and 4.56 respectively. This relationship is depicted in Figure 26.

The result for small signal and rectifier diodes is:

$$\text{Failure rate} \propto (V_S)^{2.4} \quad R^2 = .45 \quad [0 < V_S \leq 1.0]$$

where V_S is the reverse voltage stress. The lower and upper 95% confidence values about " a_2 " are .96 and 2.43 respectively. This relationship is depicted in Figure 27.

Although insufficient data was available to analyze the effects of derating for device types other than bipolar transistors, small signal diodes and rectifiers, it is anticipated that given sufficient data for other parts in this publication, the benefits of derating would be further exemplified. The relationships presented are only valid within the range of stresses found in the data analyzed. This would include stress values from .1 to 1.0, and would not include overstress conditions.

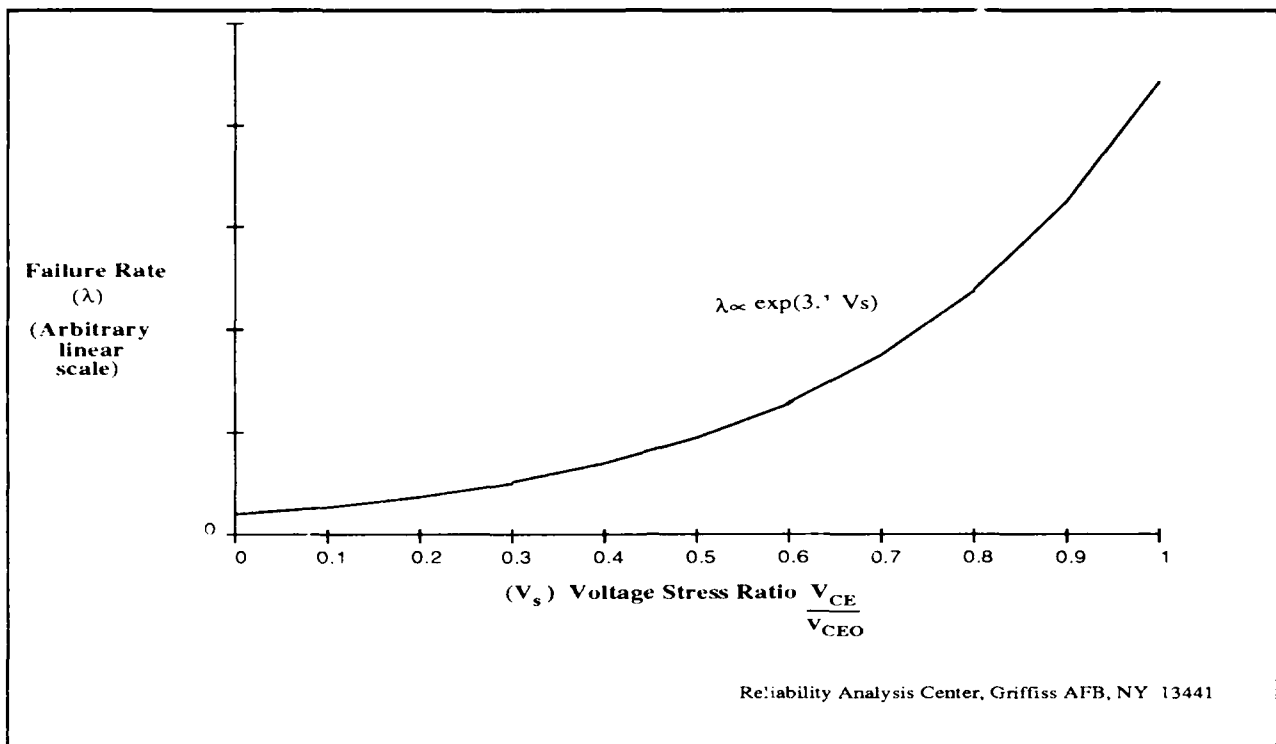


FIGURE 26: FAILURE RATE vs. VOLTAGE STRESS FOR HIGH POWER BIPOLAR TRANSISTORS

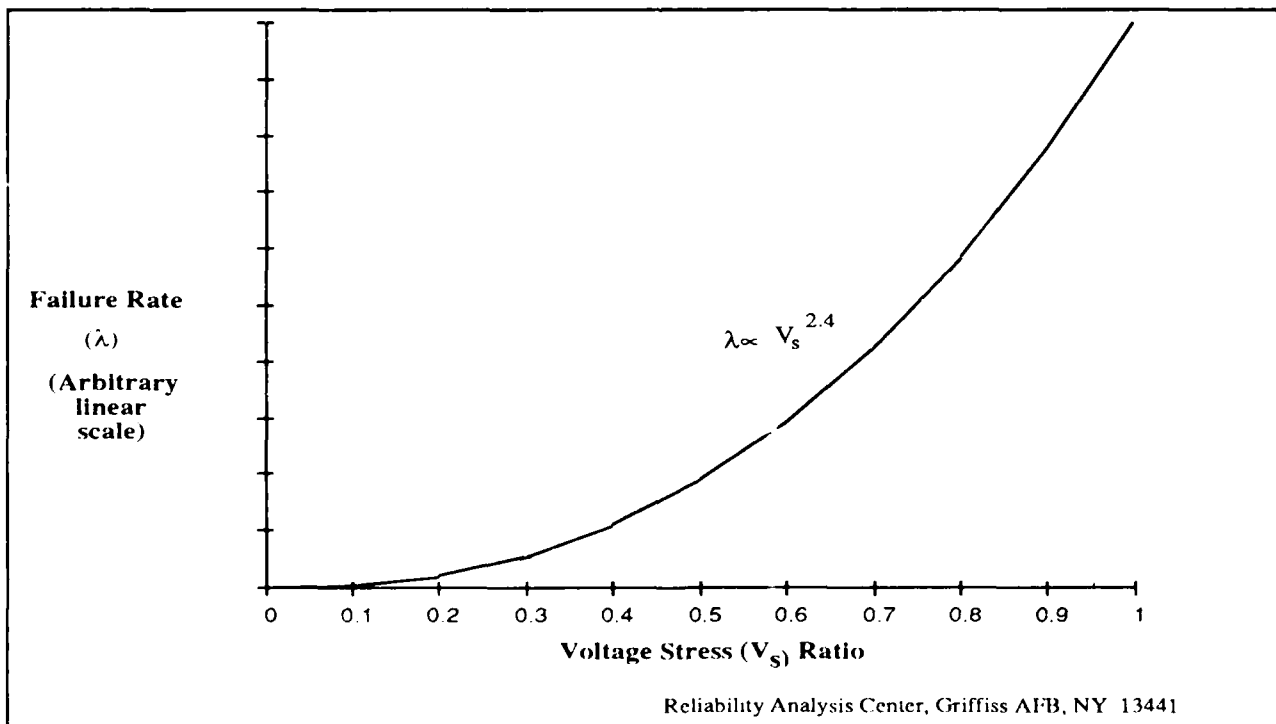


FIGURE 27: FAILURE RATE vs. VOLTAGE STRESS FOR SIGNAL AND RECTIFIER DIODES

3.0 FAILURE MODE AND MECHANISM DATA

This section presents quantitative distributions of failure modes and failure mechanisms for transistors, diodes, liquid crystal displays and photovoltaic modules.

Failure mode here refers to the externally detectable effect of a part failure. Failure mechanism generally refers to the chemical or physical process which caused the part to fail. An extended definition is used herein, due to limitations in the available data, which includes the physical location of the defect or failure within a device.

The transistor and diode data presented in Tables 7 through 10 and Figures 28 and 29 has been compiled from reports of reliability demonstration tests conducted in accordance with MIL-STD-781. All testing and device failures were therefore conducted and evaluated against similar criteria. Only primary, verified failures were included in the data. Additionally no failures resulting from mishandling or overstress conditions were included. Data from reliability demonstration test reports included in DSR-3 which met the above criteria was included along with new data collected since that publication.

Insufficient detail was available to determine if the individual parts represented in these analyses were hermetically sealed or plastic encapsulated. Differences in distributions of failure modes and mechanisms would be expected depending upon many factors, including hermeticity. However, since all diode and transistor failure mode/mechanism data was taken from military equipments, it can be assumed that the vast majority of the parts were hermetically sealed.

Table 11 and Figure 30 present failure mode and mechanism data on a liquid crystal displays. This data should be viewed with scrutiny in comparison with other similar parts since it is from a single, reliable data source on a single part type. This data was included here because of the general lack of such information within the industry. However, significantly more data must be collected before any general conclusions can be made about the failure behavior of liquid crystal displays.

Table 12 and Figure 31 present available failure mode data on photovoltaic cell modules. This data was compiled from 5 experimental test sites across the United States in a program sponsored by the United States Department of Energy (Reference 13) and used with permission of IEEE.

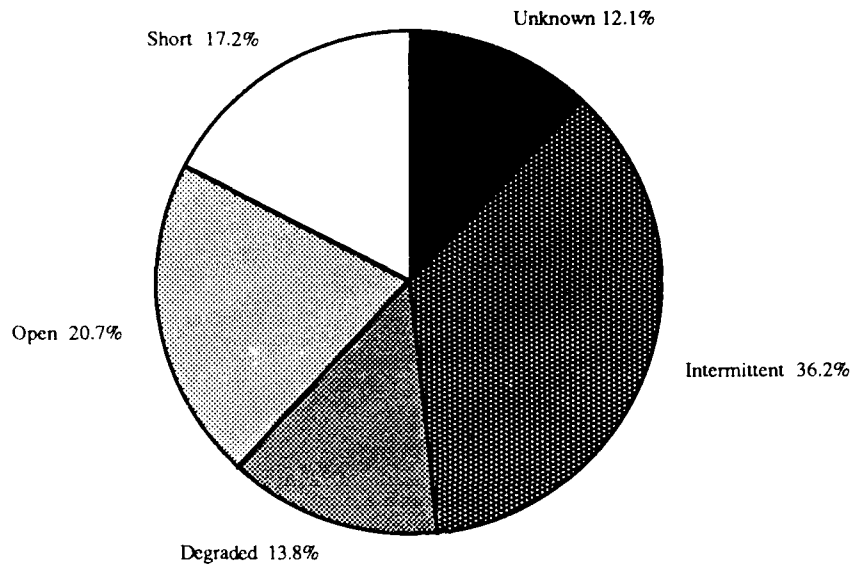
The information in these tables and figures, particularly those relating to failure modes, will be beneficial to engineers performing Failure Modes, Effects and Criticality Analysis (FMECAs) in the evaluation of system designs.

TABLE 7: DIODE FAILURE MODES

MODE	QUANTITY	%	NORMALIZED %
Open	12	20.7	23.5
Short	10	17.2	19.6
Degraded	8	13.8	15.7
Intermittent	21	36.2	41.2
Unknown	7	12.1	- -

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DIODE FAILURE MODE DISTRIBUTION



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FIGURE 28: DIODE FAILURE MODE DISTRIBUTION

TABLE 8: DIODE FAILURE MECHANISMS/LOCATION

MECHANISM/ LOCATION	QUANTITY	%	NORMALIZED %
Wire Bond	2	5.6	8.7
Broken Wire	1	2.8	4.3
Contamination	2	5.6	8.7
Cracked Die	4	11.1	17.4
Cracked Glass Case	10	27.8	43.5
Lifted Wire	1	2.8	4.3
Package	1	2.8	4.3
Whisker Alignment	2	5.6	8.7
Unknown	13	36.1	--

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TABLE 9: TRANSISTOR FAILURE MODES

MODE	QUANTITY	%	NORMALIZED %
Open	49	52.1	56.3
Short	17	18.1	19.5
Degraded	14	15.0	16.1
Intermittent	7	7.4	8.0
Unknown	7	7.4	--

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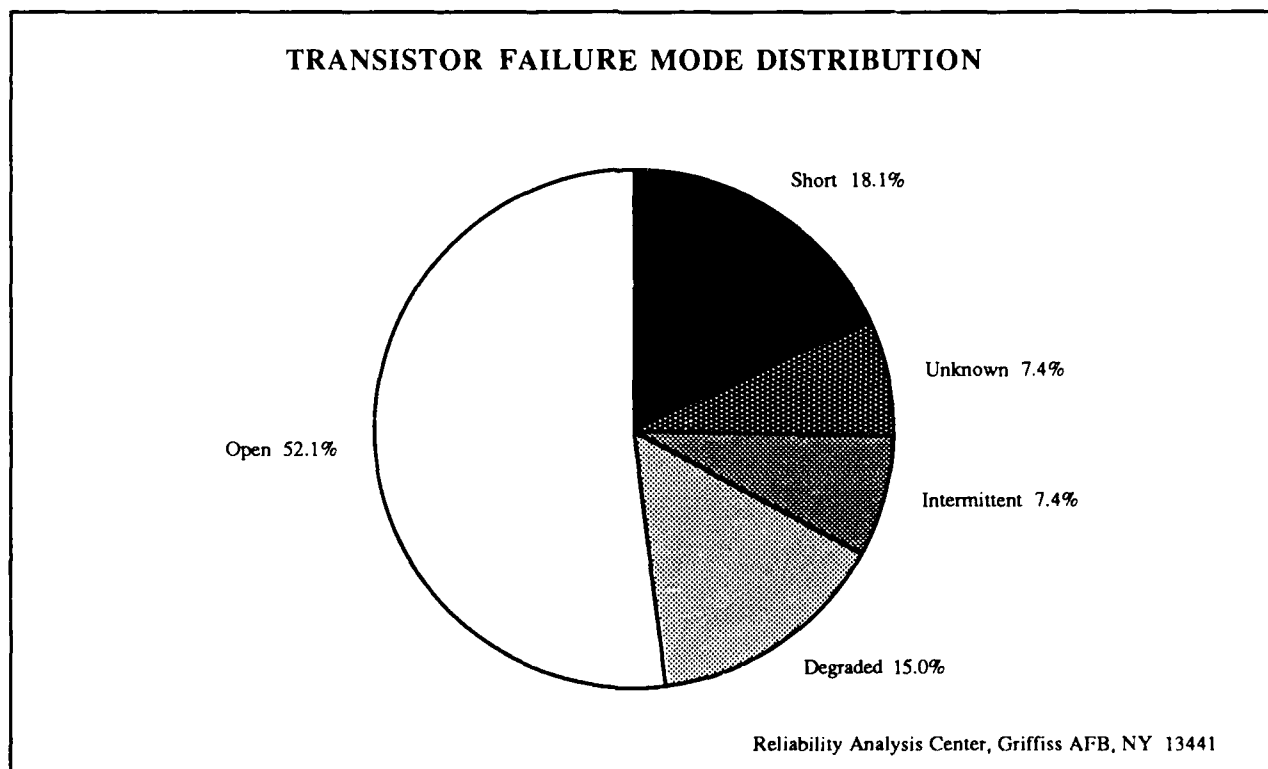


FIGURE 29: TRANSISTOR FAILURE MODE DISTRIBUTION

TABLE 10: TRANSISTOR FAILURE MECHANISM/LOCATION

MECHANISM/ LOCATION	QUANTITY	%	NORMALIZED %
Wire Bond	26	27.7	43.3
Die	7	7.4	11.7
Contamination	1	1.1	1.7
Lifted Die	1	1.1	1.7
Metallization	14	14.9	23.3
Oxide Defect	3	3.2	5.0
Interconnect	8	8.5	13.3
Unknown	34	36.1	--

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TABLE 11: LIQUID CRYSTAL DISPLAY FAILURE DISTRIBUTION

FAILURE LOCATION AND ASSOCIATED MODES	QUANTITY	%
Conductive Epoxy Interconnect		
Dim Rows	44	33.3
Flickering Rows	22	16.7
Missing Rows	5	3.8
Integrated Circuit		
Blank Display	9	6.8
Improper Characters	16	12.1
Zebra Strip		
Flashing Dots	5	3.8
Missing or Dim Columns	11	8.3
Miscellaneous Manufacturing Defects	20	15.2

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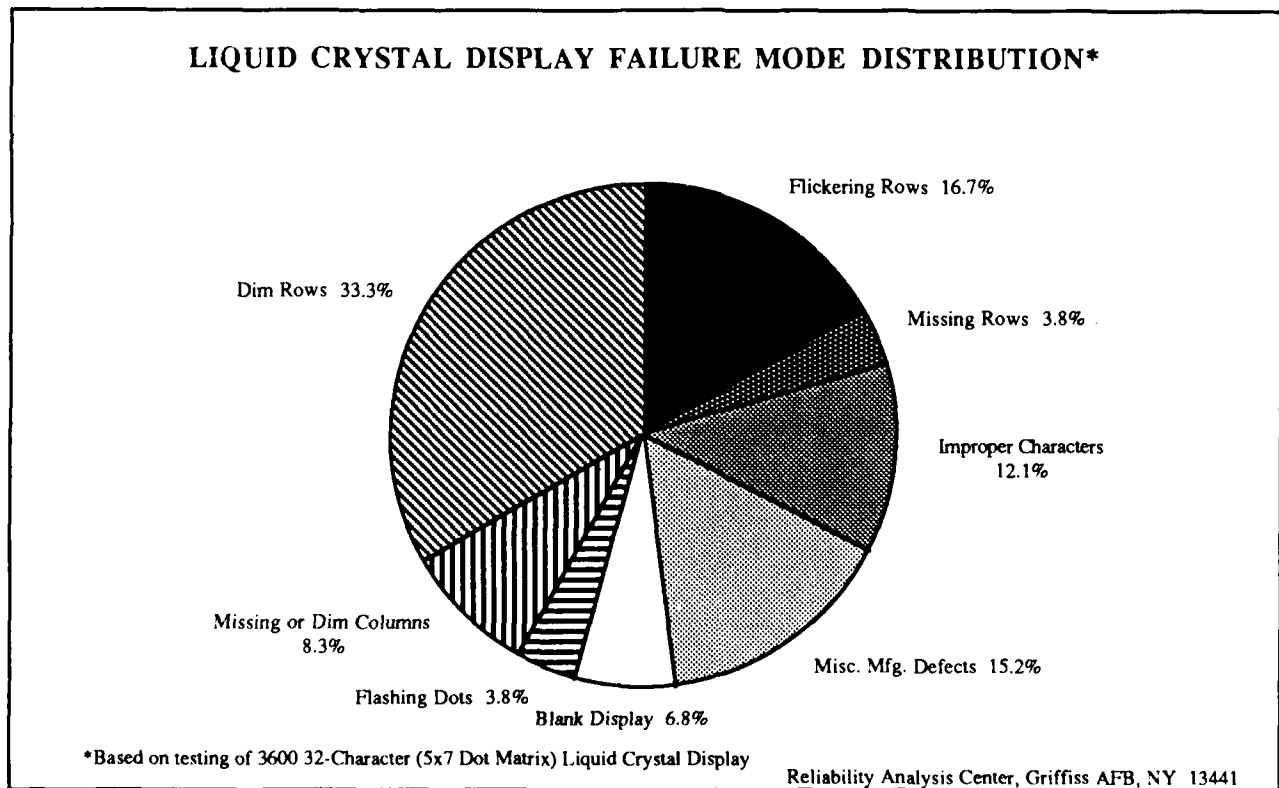


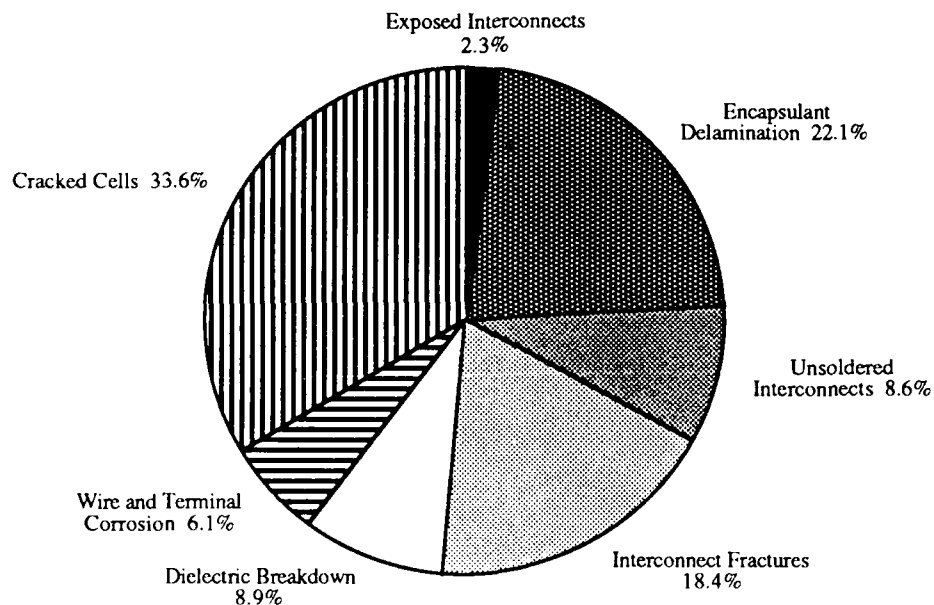
FIGURE 30: LIQUID CRYSTAL DISPLAY FAILURE MODE DISTRIBUTION

TABLE 12: PHOTOVOLTAIC CELL MODULES FAILURE DISTRIBUTION

FAILURE TYPE	QUANTITY	%
Interconnect Fractures	64	18.4
Unsoldered Interconnects	30	8.6
Cracked Cells	117	33.6
Dielectric Breakdown	31	8.9
Encapsulant Delamination	77	22.1
Wire and Terminal Corrosion	21	6.1
Exposed Interconnects	8	2.3

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PHOTOVOLTAIC CELL ARRAY FAILURE MODE DISTRIBUTION*



* (C) 1982 IEEE, with permission from Dumes, L. and S. Shumka, "Photovoltaic Module Reliability Improvements Through Application Testing and Failure Analysis." IEEE Transactions on Reliability, Vol. R-31, No. 3, August 1982, p. 234

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FIGURE 31: PHOTOVOLTAIC CELL ARRAY FAILURE MODE DISTRIBUTION

4.0 DETAILED DATA

This section presents the detailed failure rate data for diodes, transistors, thyristors and optoelectronics, in that order. Descriptions of the various column entries are given in Section 1.0, "User's Guide to DSR-4." Each of the four part categories (diodes, transistors, thyristors and optoelectronics) are broken down into subcategories which further define the part type. For example, under the diode listing are: small signal switching, small signal general purpose, rectifier, fast recovery, etc. These subcategories are listed below. Within each subcategory, part level data is listed in order by test type (life then field) and then by generic part number.

The data fields and associated field values in the detailed data section are explained below:

Diode

- Small Signal, Switching
- Small Signal, General Purpose
- Rectifier
- Rectifier, Fast Recovery
- Rectifier, Bridge, Full Wave
- Zener
- Zener, Voltage Regulator
- Zener, Voltage Reference
- Current Regulator
- Transient Suppressor
- Microwave, Tunnel
- Microwave, Schottky Barrier
- Microwave, PIN
- Microwave, Varactor
- Microwave, GUNN Effect
- Microwave, IMPATT

Transistor

- Bipolar, NPN
- Bipolar, PNP
- Field Effect, Junction, N-channel
- Field Effect, Junction, P-channel
- Field Effect, MOS, N-channel
- Field Effect, MOS, P-channel
- Unijunction
- Microwave/RF, Field Effect
- Microwave/RF, Bipolar
- Multiple, Complementary Pair
- Multiple, Darlington
- Multiple, Matched Pair
- Special Function, Chopper

Thyristor

- Thyristor
- SCR
- TRIAC
- Triode, Trigger

Optoelectronic

Emitter, Single LED
Emitter, Single LED, Infrared
Emitter, LED Array
Emitter, Laser Diode
Sensor, Photodiode
Sensor, Phototransistor
Photocoupler,
Photocoupler, Phototransistor Output
Photocoupler, Photodarlington Output
Photocoupler, IC Output
Alphanumeric Display, LED, Segment Type
Alphanumeric Display, LED, Array Type
Alphanumeric Display, Liquid Crystal
Photovoltaic Module

The data fields and associated field values in the detailed data section are described below:

<u>Field</u>	<u>Description</u>														
Part Number	The basic device part number plus suffix. "--" indicates unknown part number.														
Slash Number	The MIL-slash number according to MIL-S-19500, <u>Military Specification: Semiconductor Device, General Specification for</u> . "--" indicates an unknown MIL-slash number.														
Equipment Reference	The system/equipment nomenclature from which the data was obtained. All data sources are described in detail in Section 5.0. For test data, N/A refers to not applicable.														
Package Type	The outline package reference designation. "--" indicates unknown drawing number.														
Semi. Material	The semiconductor material the component is fabricated from: <table><tr><td>--</td><td>Unknown</td></tr><tr><td>Si</td><td>Silicon</td></tr><tr><td>Ge</td><td>Germanium</td></tr><tr><td>GaAs</td><td>Gallium-Arsenide</td></tr><tr><td>GaP</td><td>Gallium Phosphide</td></tr><tr><td>GaAsP</td><td>Gallium-Arsenide-Phosphide</td></tr><tr><td>AlGaAs</td><td>Aluminum-Gallium-Arsenide</td></tr></table>	--	Unknown	Si	Silicon	Ge	Germanium	GaAs	Gallium-Arsenide	GaP	Gallium Phosphide	GaAsP	Gallium-Arsenide-Phosphide	AlGaAs	Aluminum-Gallium-Arsenide
--	Unknown														
Si	Silicon														
Ge	Germanium														
GaAs	Gallium-Arsenide														
GaP	Gallium Phosphide														
GaAsP	Gallium-Arsenide-Phosphide														
AlGaAs	Aluminum-Gallium-Arsenide														
Quality Level	A factor describing both the screen level and package hermeticity of the device as described in MIL-S-19500 including: JANTXV, JANTX, JAN, Lower (Commercial Hermetic) and Plastic (Commercial Plastic Encapsulated) "--" indicates unknown quality level. In addition, the following quality levels were employed to further characterize non-MIL-S-19500 part types:														

<u>Field</u>	<u>Description</u>
Quality Level (cont'd)	
JTXEQU	- Screening equivalent to JANTX level for NON-QPL parts
JANEQU	- Screening equivalent to JAN level for NON-QPL parts
HERMETIC	- Hermetically packaged laser diode
FACET COAT	- Laser diode with Facet Coating and nonhermetic package

App Env The MIL-HDBK-217E-type application environment coded as:

<u>Application Environment</u>	<u>Code</u>
Unknown	--
Ground Benign	GB
Ground Fixed	GF
Ground Mobile	GM
Man Pack	MP
Naval Sheltered	NS
Naval Unsheltered	NU
Naval Undersea Unsheltered	NUU
Naval Hydrofoil	NH
Airborne Inhabited	AI
Airborne Inhabited Cargo	AIC
Airborne Inhabited Trainer	AIT
Airborne Inhabited Bomber	AIB
Airborne Inhabited Attack	AIA
Airborne Inhabited Fighter	AIF
Airborne Uninhabited	AU
Airborne Uninhabited Cargo	AUC
Airborne Uninhabited Trainer	AUT
Airborne Uninhabited Bomber	AUB
Airborne Uninhabited Attack	AUA
Airborne Uninhabited Fighter	AUF
Airborne Rotary Winged	ARW
Missile Launch	ML
Cannon Launch	CL
Undersea Launch	UL
Missile Free Flight	MFF
Airbreathing Missile Flight	MFA

Temp The temperature in degrees Centigrade associated with the device failure. An "A" following the entry indicates ambient temperature, "C" indicates case, and "J" indicates junction temperature. "--" indicates unknown temperature.

<u>Field</u>	<u>Description</u>
Rated Current	<p>The current rating in Amperes of the device. This value is given for diodes, thyristors and optoelectronic devices as follows:</p> <p>Small Signal, Switching Diode, forward current (If)</p> <p>Small Signal, General Purpose Diode, forward current (If)</p> <p>Rectifier Diode, forward current (If)</p> <p>Zener Diode, dynamic impedance current (Iz)</p> <p>Thyristors, maximum static on-state current (If)</p> <p>LED, forward current (If)</p> <p>Laser Diode, forward current (If)</p> <p>Sensor, Photodiode, forward current (If)</p> <p>Sensor, Phototransistor, collector current (Ic)</p> <p>Photocoupler, forward current (If)</p> <p>--" indicates unknown</p>
Rated Power	<p>The maximum rated power dissipation in Watts. This value is given for transistors, and photovoltaic cell arrays. --" indicates unknown.</p>
Voltage Stress	<p>The applied divided by the rated voltage for the device. Stresses given are for the following parameters:</p> <p>Small Signal, Switching Diode, working peak reverse voltage (V_{RWM})</p> <p>General Purpose Diode, working peak reverse voltage (V_{RWM})</p> <p>Rectifier Diode, working peak reverse voltage (V_{RWM})</p> <p>--" indicates unknown</p>
Current Stress	<p>The applied divided by the rated current for the device. Stresses are given for the following parameters:</p> <p>Small Signal, Switching Diode, average forward current (If)</p> <p>Small Signal, General Purposed Diode, average forward current (If)</p> <p>Rectifier Diode, average forward current (If)</p>

<u>Field</u>	<u>Description</u>																																		
Current Stress (cont'd)	<p>Thyristor, maximum static on-state current (I_t)</p> <p>Bipolar Transistor, collector current (I_c)</p> <p>Field Effect Transistor, reverse gate current (I_{gss})</p> <p>Unijunction Transistor, emitter current (I_e)</p> <p>LED, forward current (I_f)</p> <p>Laser Diode, forward current (I_f)</p> <p>Sensor, Photodiode, forward current (I_f)</p> <p>Sensor, Phototransistor, collector current (I_c)</p> <p>Photocoupler, forward current (I_f)</p> <p>--" indicates unknown</p>																																		
Freq. Band	<p>Operating frequency for microwave devices coded as follows:</p> <table> <tr> <th><u>Approximate Band (Code)</u></th><th><u>Frequency (GHz)</u></th></tr> <tr> <td>--</td><td>Unknown</td></tr> <tr> <td>< 1GHz</td><td><1 GHz</td></tr> <tr> <td>L</td><td>1 - 1.9</td></tr> <tr> <td>S</td><td>2 - 3.9</td></tr> <tr> <td>C</td><td>4 - 7.9</td></tr> <tr> <td>X</td><td>8 - 11.9</td></tr> <tr> <td>Ky</td><td>12 - 17.9</td></tr> <tr> <td>K</td><td>18 - 25.9</td></tr> <tr> <td>Kq</td><td>26 - 39.9</td></tr> <tr> <td>Q</td><td>40 - 49.9</td></tr> <tr> <td>V</td><td>50 - 54.9</td></tr> <tr> <td>W</td><td>55 - 99.9</td></tr> <tr> <td>D</td><td>100 - 149.9</td></tr> <tr> <td>G</td><td>150 - 199.9</td></tr> <tr> <td>Y</td><td>200 - 249.9</td></tr> <tr> <td>**</td><td>> 250.0</td></tr> </table>	<u>Approximate Band (Code)</u>	<u>Frequency (GHz)</u>	--	Unknown	< 1GHz	<1 GHz	L	1 - 1.9	S	2 - 3.9	C	4 - 7.9	X	8 - 11.9	Ky	12 - 17.9	K	18 - 25.9	Kq	26 - 39.9	Q	40 - 49.9	V	50 - 54.9	W	55 - 99.9	D	100 - 149.9	G	150 - 199.9	Y	200 - 249.9	**	> 250.0
<u>Approximate Band (Code)</u>	<u>Frequency (GHz)</u>																																		
--	Unknown																																		
< 1GHz	<1 GHz																																		
L	1 - 1.9																																		
S	2 - 3.9																																		
C	4 - 7.9																																		
X	8 - 11.9																																		
Ky	12 - 17.9																																		
K	18 - 25.9																																		
Kq	26 - 39.9																																		
Q	40 - 49.9																																		
V	50 - 54.9																																		
W	55 - 99.9																																		
D	100 - 149.9																																		
G	150 - 199.9																																		
Y	200 - 249.9																																		
**	> 250.0																																		
Duty Cycle	<p>Percentage of time the device is under electrical stress.</p> <p>--" indicates unknown duty cycle.</p>																																		
Character Count	<p>The number of characters present in a optoelectronic alphanumeric display. --" indicates unknown character count.</p>																																		

<u>Field</u>	<u>Description</u>
Diode Count	The number of LEDs comprising an optoelectronic array or alphanumeric display. "--" indicates unknown diode count.
V_{oc}	Open circuit voltage for photovoltaic modules. "--" indicates unknown.
I_{sc}	Short circuit current for photovoltaic modules. "--" indicates unknown.
Number Tested	Quantity of parts under the described test or field conditions for that data point. "--" indicates unknown quantity tested.
Number Failed	The quantity of parts in the number tested column which failed.
Part Hours	The total number of parts tested multiplied by the total operating hours
Failure Rate	The total quantity of failures divided by the total quantity of part hours for records with failures. Units are failures per 10^6 operating hours.

Diode Section

Test Type : FIELD

Device : DIODE, SMALL SIGNAL, SWITCHING

Part Number	Slash Number	Equipment Reference	Package Type	Semi. Material	Quality Level	App Env	Temp °C	Rated Current (A)	Voltage Stress	Current Stress	Parts Tested	Number Failed	Part Hours (E06)	Failure Rate (f/10E6 Hrs)
1N3604	--	COMMERCIAL	D07	Si	LOWER	GB	40A	0.01000	--	--	2011	6	2.614300	2.29507
1N4148	116	F-16 HUD	D035	Si	JANTX	AIF	40A	0.50000	--	--	1016	1	0.552700	1.80930
1N4148-1	116	F-16 HUD	D035	Si	JANTX	AIF	40A	0.50000	--	--	753	9	0.409407	21.98301
1N4150-1	231	F-16 HUD	A1AP	Si	JANTX	AIF	40A	0.20000	--	--	2032	0	1.105394	--
1N4153	337	AN/BRD-7	A1AP	Si	JANTX	NSB	25A	0.15000	--	--	6384	0	20.268060	--
1N4454	144	AN/ARN-118	D035	Si	JANTX	AIC	55A	0.01000	0.251	0.699	15862	1	14.985313	0.06673
1N4454	144	AN/ARN-118	D035	Si	JANTX	AIT	55A	0.01000	0.251	0.689	6580	2	18.839786	0.10616
1N4454	144	AN/ARN-118	D035	Si	JANTX	AIB	55A	0.01000	0.251	0.689	2632	0	3.981166	--
1N4454	144	AN/ARN-118	D035	Si	JANTX	AIA	55A	0.01000	0.251	0.689	4557	1	3.534909	0.28289
1N4454	144	AN/ARN-118	D035	Si	JANTX	AIF	55A	0.01000	0.251	0.689	10157	1	5.938219	0.16840
1N4454	144	AN/ARN-118	D035	Si	JANTX	AUC	71A	0.01000	0.251	0.689	224334	1	211.940000	0.00472
1N4454	144	AN/ARN-118	D035	Si	JANTX	AUT	71A	0.01000	0.251	0.689	93060	1	136.783000	0.00731
1N4454	144	AN/ARN-118	D035	Si	JANTX	AUT	71A	0.01000	0.251	0.689	1880	0	2.763222	--
1N4454	144	AN/ARN-118	D035	Si	JANTX	AUB	71A	0.01000	0.251	0.689	37224	1	56.305062	0.01776
1N4454	144	AN/ARN-118	D035	Si	JANTX	AUB	71A	0.01000	0.251	0.689	752	0	1.137476	--
1N4454	144	AN/ARN-118	D035	Si	JANTX	AUA	71A	0.01000	0.251	0.689	64449	1	49.993713	0.02000
1N4454	144	AN/ARN-118	D035	Si	JANTX	AUA	71A	0.01000	0.251	0.689	1302	3	1.009974	2.97037
1N4454	144	AN/ARN-118	D035	Si	JANTX	AUF	71A	0.01000	0.251	0.689	2902	2	1.699572	1.17677
1N4454	144	AN/ARN-118	D035	Si	JANTX	AUF	71A	0.01000	0.251	0.689	143649	1	84.128814	0.01189
1N4454	144	F-16 FCC	D035	Si	JANTX	AIF	40A	0.01000	--	--	103244	23	45.066000	0.51036
1N5711	444	AN/BRD-7	A1UA	Si	JANTX	NSB	25A	0.00100	--	--	8708	2	27.646345	0.07234
1N5712	445	AN/BRD-7	A1AC	Si	JANTX	NSB	25A	0.00100	--	--	28	0	0.088895	--
DA1701	--	AN/ARN-118	D035	Si	JTX EQU	AUC	71A	0.00100	--	--	29458	0	27.829867	--
DA1701	--	AN/ARN-118	D035	Si	JTX EQU	AUC	71A	0.00100	--	--	49852	12	47.096698	0.25479
DA1701	--	AN/ARN-118	D035	Si	JTX EQU	AUT	71A	0.00100	--	--	20680	10	30.395442	0.32900
DA1701	--	AN/ARN-118	D035	Si	JTX EQU	AUT	71A	0.00100	--	--	12220	0	17.960943	--
DA1701	--	AN/ARN-118	D035	Si	JTX EQU	AUB	71A	0.00100	--	--	4888	0	7.393594	--
DA1701	--	AN/ARN-118	D035	Si	JTX EQU	AUB	71A	0.00100	--	--	8272	2	12.512235	0.00984
DA1701	--	AN/ARN-118	D035	Si	JTX EQU	AUA	71A	0.00100	--	--	14322	3	11.109714	0.27003
DA1701	--	AN/ARN-118	D035	Si	JTX EQU	AUA	71A	0.00100	--	--	8463	0	6.564831	--
DA1701	--	AN/ARN-118	D035	Si	JTX EQU	AUF	71A	0.00100	--	--	31922	3	18.656506	0.16080

Diode Section

Test Type : FIELD

Device : DIODE, SMALL SIGNAL, SWITCHING (CONTINUED FROM PREVIOUS PAGE)

Part Number	Slash Number	Equipment Reference	Package Type	Semi. Material	Quality Level	App Env	Temp °C	Rated Current (A)	Voltage Stress	Current Stress	Parts Tested	Number Failed	Part Hours	Failure Rate (f/10E6 Hrs)
DA1701	--	AN/ARN-118	D035	Si	JTX EQU	AUF	71A	0.00100	--	--	18863	0	11.047218	--

Test Type : FIELD

Device : DIODE, SMALL SIGNAL, GENERAL PURPOSE

Part Number	Slash Number	Equipment Reference	Package Type	Semi. Material	Quality Level	App Env	Temp °C	Rated Current (A)	Voltage Stress	Current Stress	Parts Tested	Number Failed	Part Hours	Failure Rate (f/10E6 Hrs)
1N218	--	COMMERCIAL	C1	Si	LOWER	GB	40A	0.00600	--	--	2590	1	3.367000	0.29700
1N277	--	COMMERCIAL	D07	Ge	PLASTIC	GB	40A	0.10000	--	--	19795	2	25.733500	0.07772
1N34A	--	COMMERCIAL	A9K	Ge	LOWER	GB	40A	0.00500	--	--	4	0	0.005200	--
1N38B	--	COMMERCIAL	A9K	Ge	LOWER	GB	40A	0.00400	--	--	15319	0	19.914700	--
1N5767	--	AN/ARN-118	A1AH	Si	JTX EQU	AUC	71A	0.10000	0.120	0.010	15862	0	14.985313	--
1N5767	--	AN/ARN-118	A1AH	Si	JTX EQU	AUT	71A	0.10000	0.120	0.010	6580	0	9.671277	--
1N5767	--	AN/ARN-118	A1AH	Si	JTX EQU	AUB	71A	0.10000	0.120	0.010	2632	0	3.981166	--
1N5767	--	AN/ARN-118	A1AH	Si	JTX EQU	AUA	71A	0.10000	0.120	0.010	4557	0	3.534909	--
1N5767	--	AN/ARN-118	A1AH	Si	JTX EQU	AUF	71A	0.10000	0.120	0.010	10157	0	5.948502	--

Test Type : FIELD

Device : DIODE, RECTIFIER

Part Number	Slash Number	Equipment Reference	Package Type	Semi. Material	Quality Level	App Env	Temp °C	Rated Current (A)	Voltage Stress	Current Stress	Parts Tested	Number Failed	Part Hours	Failure Rate (f/10E6 Hrs)
1N1183A	--	COMMERCIAL	D05	Si	LOWER	GB	40A	40.00000	--	--	11885	0	15.450500	--
1N1184A	--	COMMERCIAL	D05	Si	LOWER	GB	40A	40.00000	--	--	334476	22	434.818800	0.05060
1N1186	297	AN/BRD-7	D05	Si	JAN	NSB	25A	35.00000	--	--	364	3	1.155635	2.59598
1N1186AR	--	COMMERCIAL	D05	Si	LOWER	GB	40A	35.00000	--	--	1024	0	1.331200	--
1N1200	--	COMMERCIAL	D04	Si	LOWER	GB	40A	12.00000	--	--	155273	40	201.854900	0.19816
1N1202A	260	AN/BRD-7	D04	Si	JANTX	NSB	25A	12.00000	--	--	1288	0	4.089170	--
1N1204A	260	AN/BRD-7	D04	Si	JANTX	NSB	25A	12.00000	--	--	112	0	0.355580	--
1N1206A	--	COMMERCIAL	D04	Si	LOWER	GB	40A	12.00000	--	--	21260	10	27.638000	0.36182
1N1247A	--	COMMERCIAL	D04	Si	LOWER	GB	40A	6.00000	--	--	3810	0	4.953000	--
1N2219A	--	AN/BRD-7	S35	Si	JTX EQU	NSB	25A	1.50000	--	--	56	0	0.177790	--
1N3209	--	COMMERCIAL	S4N	Si	LOWER	GB	40A	15.00000	--	--	87550	16	113.815000	0.14058

Diode Section

Test Type : FIELD

Device : DIODE, RECTIFIER (CONTINUED FROM PREVIOUS PAGE)

Part Number	Slash Number	Equipment Reference	Package Type	Semi. Material	Quality Level	App Env	Temp °C	Rated Current (A)	Voltage Stress	Current Stress	Parts Tested	Number Failed	Part Hours (E06)	Failure Rate (f/10E6 Hrs)
1N3261R	--	COMMERCIAL	DO9	Si	LOWER	GB	40A	160.00000	--	--	7909	5	10.281700	0.48630
1N3289	--	COMMERCIAL	DO8	Si	LOWER	GB	40A	100.00000	--	--	2535	3	3.295500	0.91033
1N3289R	--	COMMERCIAL	DO8	Si	LOWER	GB	40A	100.00000	--	--	11606	3	15.087800	0.19884
1N3290R	--	COMMERCIAL	DO8	Si	LOWER	GB	40A	100.00000	--	--	4230	0	5.499000	--
1N3736	--	COMMERCIAL	DO9	Si	LOWER	GB	40A	250.00000	--	--	2893	2	3.760900	0.53179
1N3881	--	COMMERCIAL	DO4	Si	LOWER	GB	40A	6.00000	--	--	6550	0	8.515000	--
1N3889R	--	COMMERCIAL	DO4	Si	LOWER	GB	40A	12.00000	--	--	62178	3	80.831400	0.03711
1N3890R	--	COMMERCIAL	DO4	Si	LOWER	GB	40A	12.00000	--	--	38594	0	50.172200	--
1N3891	--	COMMERCIAL	DO4	Si	LOWER	GB	40A	12.00000	--	--	1285	0	1.670500	--
1N4002	--	AN/ARN-118	DO4	Si	JTX EQU	AUC	71A	1.00000	0.439	0.009	18128	1	17.126072	0.05839
1N4002	--	AN/ARN-118	DO4	Si	JTX EQU	AUT	71A	1.00000	0.439	0.009	7520	0	11.052888	--
1N4002	--	AN/ARN-118	DO4	Si	JTX EQU	AUB	71A	1.00000	0.439	0.009	3008	0	4.549904	--
1N4002	--	AN/ARN-118	DO4	Si	JTX EQU	AUA	71A	1.00000	0.439	0.009	5208	2	4.039896	0.49506
1N4002	--	AN/ARN-118	DO4	Si	JTX EQU	AUF	71A	1.00000	0.439	0.009	11608	1	6.798288	0.14710
1N4002	--	COMMERCIAL	DO4	Si	JTX EQU	GB	40A	1.00000	--	--	511460	22	664.898000	0.03309
1N4004	--	COMMERCIAL	DO41	Si	LOWER	GB	40A	1.00000	--	--	4317707	250	5613.019100	0.04454
1N4007	--	COMMERCIAL	DO41	Si	LOWER	GB	40A	1.00000	--	--	239135	50	310.875500	0.16084
1N4245	286	AN/BRD-7	DO15	Si	JANTX	NSB	25A	1.00000	--	--	112	0	0.355580	--
1N4246	285	AN/BRD-7	DO15	Si	JANTX	NSB	25A	1.00000	--	--	504	0	1.600110	--
1N457	193	AN/ARN-118	A21	Si	JANTX	AUC	71A	0.02000	0.074	0.025	2266	0	2.140759	--
1N457	193	AN/ARN-118	A21	Si	JANTX	AUT	71A	0.02000	0.074	0.025	940	0	1.381611	--
1N457	193	AN/ARN-118	A21	Si	JANTX	AUB	71A	0.02000	0.074	0.025	376	0	0.568738	--
1N457	193	AN/ARN-118	A21	Si	JANTX	AUA	71A	0.02000	0.074	0.025	651	0	0.504987	--
1N457	193	AN/ARN-118	A21	Si	JANTX	AUF	71A	0.02000	0.074	0.025	1451	0	0.849786	--
1N5550	420	F-16 FCC	A248A	Si	JANTX	AIF	40A	5.00000	--	--	9740	0	4.251500	--
1N5551	420	AN/ARN-118	A248A	Si	JANTX	AIC	55A	0.50000	--	--	4532	1	4.281518	0.23356
1N5551	420	AN/ARN-118	A248A	Si	JANTX	AIT	55A	0.50000	--	--	1880	0	5.382796	--
1N5551	420	AN/ARN-118	A248A	Si	JANTX	AIB	55A	0.50000	--	--	752	0	1.137476	--
1N5551	420	AN/ARN-118	A248A	Si	JANTX	AIA	55A	0.50000	--	--	1302	0	1.009974	--
1N5551	420	AN/ARN-118	A248A	Si	JANTX	AIF	55A	0.50000	--	--	2902	0	1.696634	--
1N5551	420	AN/ARN-118	A248A	Si	JANTX	AUC	71A	0.50000	--	--	4532	6	4.281518	1.40137

Diode Section

Test Type : FIELD

Device : DIODE, RECTIFIER (CONTINUED FROM PREVIOUS PAGE)

Part Number	Slash Number	Equipment Reference	Package Type	Semi. Material	Quality Level	App Env	Temp Oc	Rated Current (A)	Voltage Stress	Current Stress	Parts Tested	Number Failed	Part Hours	Failure Rate (f/10E6 Hrs)
1N5551	420	AN/ARN-118	A248A	Si	JANTX	AUT	71A	0.50000	--	--	1880	2	2.763222	0.72379
1N5551	420	AN/ARN-118	A248A	Si	JANTX	AUB	71A	0.50000	--	--	752	0	1.137476	--
1N5551	420	AN/ARN-118	A248A	Si	JANTX	AUA	71A	0.50000	--	--	1302	0	1.009974	--
1N5551	420	AN/ARN-118	A248A	Si	JANTX	AUF	71A	0.50000	--	--	2902	1	1.699572	0.58838
1N5614	427	F-16 HUD	A109C	Si	JANTX	AIF	40A	1.00000	--	--	3034	0	1.650496	--
1N5614	427	F-16 FCC	A109C	Si	JANTX	AIF	40A	1.00000	--	--	2922	0	1.275453	--
1N5616	427	AN/ARN-118	D035	Si	JANTX	AUC	71A	30.00000	0.225	--	9064	1	8.563036	0.11678
1N5616	427	AN/ARN-118	D035	Si	JANTX	AUT	71A	30.00000	0.225	--	3760	0	5.526444	--
1N5616	427	AN/ARN-118	D035	Si	JANTX	AUB	71A	30.00000	0.225	--	1504	0	2.274952	--
1N5616	427	AN/ARN-118	D035	Si	JANTX	AUA	71A	30.00000	0.225	--	2604	0	2.019948	--
1N5616	427	AN/ARN-118	D035	Si	JANTX	AUF	71A	30.00000	0.225	--	5804	1	3.392092	0.29480
1N645	240	AN/BRD-7	A1WV	Si	JANTX	NSB	25A	0.40000	--	--	1624	0	5.155910	--
1N645-1	240	F-16 HUD	A1WV	Si	JANTX	AIF	40A	0.40000	--	--	3556	0	1.934416	--
1N645-1	240	F-16 FCC	A1WV	Si	JANTX	AIF	40A	0.40000	--	--	5844	1	2.550000	0.39216
1N647-1	240	F-16 HUD	A1WV	Si	JANTX	AIF	40A	0.40000	--	--	2032	0	1.105432	--
1N649	240	AN/BRD-7	A1WV	Si	JANTX	NSB	25A	0.40000	--	--	84	2	0.266685	7.49948
1N649-1	240	F-16 FCC	A1WV	Si	JANTX	AIF	40A	0.40000	--	--	18506	4	8.077900	0.49518
1N91	--	COMMERCIAL	A038	Si	PLASTIC	GB	40A	0.15000	--	--	3948	0	5.132400	--
1N91	--	COMMERCIAL	A038	Si	PLASTIC	GB	40A	0.15000	--	--	3948	0	5.132400	--

Test Type : FIELD

Device : DIODE, RECTIFIER, FAST RECOVERY

Part Number	Slash Number	Equipment Reference	Package Type	Semi. Material	Quality Level	App Env	Temp Oc	Rated Current (A)	Voltage Stress	Current Stress	Parts Tested	Number Failed	Part Hours	Failure Rate (f/10E6 Hrs)
1N3890	304	F-16 HUD	D045	Si	JANTX	AIF	40A	1.00000	--	--	508	2	0.276400	7.23589
1N3893	304	F-16 HUD	S465	Si	JANTX	AIF	40A	1.00000	--	--	508	0	0.276358	--
1N3899	--	COMMERCIAL	D05	Si	LOWER	GB	40A	20.00000	--	--	603	0	0.783900	--
1N3909P	308	AN/ARN-118	S4AD	Si	JANTX	AUC	71A	30.00000	0.400	0.100	2266	0	2.140759	--
1N3909R	308	AN/ARN-118	S4AD	Si	JANTX	AUT	71A	30.00000	0.400	0.100	940	0	1.381611	--
1N3909R	308	AN/ARN-118	S4AD	Si	JANTX	AUB	71A	30.00000	0.400	0.100	375	0	0.568738	--
1N3909R	308	AN/ARN-118	S4AD	Si	JANTX	AUA	71A	30.00000	0.400	0.100	651	0	0.504987	--
1N3909R	308	AN/ARN-118	S4AD	Si	JANTX	AUF	71A	30.00000	0.400	0.100	1451	0	0.849786	--

Diode Section

Test Type : FIELD

Device : DIODE, RECTIFIER, FAST RECOVERY (CONTINUED FROM PREVIOUS PAGE)

Part Number	Slash Number	Equipment Reference	Package Type	Semi. Material	Quality Level	App Env	Temp °C	Rated Current (A)	Voltage Stress	Current Stress	Parts Tested	Number Failed	Part Hours (E06)	Failure Rate (f/10E6 Hrs)
1N5416	411	AN/ARN-118	A248A	Si	JANTX	AUC	71A	80.00000	0.120	0.003	15862	0	14.985313	--
1N5416	411	AN/ARN-118	A248A	Si	JANTX	AUT	71A	80.00000	0.120	0.003	6580	2	9.671277	0.20680
1N5416	411	AN/ARN-118	A248A	Si	JANTX	AUB	71A	80.00000	0.120	0.003	2632	0	3.981166	--
1N5416	411	AN/ARN-118	A248A	Si	JANTX	AUA	71A	80.00000	0.120	0.003	4557	0	3.534909	--
1N5416	411	AN/ARN-118	A248A	Si	JANTX	AUF	71A	80.00000	0.120	0.003	10157	0	5.948502	--
1N5417	411	AN/ARN-118	A248	Si	JANTX	AUC	71A	80.00000	0.600	0.002	2266	0	2.140759	--
1N5417	411	AN/ARN-118	A248	Si	JANTX	AUT	71A	80.00000	0.600	0.002	940	0	1.381611	--
1N5417	411	AN/ARN-118	A248	Si	JANTX	AUB	71A	80.00000	0.600	0.002	376	0	0.568738	--
1N5417	411	AN/ARN-118	A248	Si	JANTX	AUA	71A	80.00000	0.600	0.002	651	0	0.504987	--
1N5417	411	AN/ARN-118	A248	Si	JANTX	AUF	71A	80.00000	0.600	0.002	1451	0	0.849786	--
1N5615	429	AN/ARN-118	A109C	Si	JANTX	AUC	71A	25.00000	0.440	--	4532	0	4.281518	--
1N5615	429	AN/ARN-118	A109C	Si	JANTX	AUT	71A	25.00000	0.440	--	1880	0	2.763222	--
1N5615	429	AN/ARN-118	A109C	Si	JANTX	AUB	71A	25.00000	0.440	--	752	0	1.137476	--
1N5615	429	AN/ARN-118	A109C	Si	JANTX	AUA	71A	25.00000	0.440	--	1302	0	1.009974	--
1N5615	429	AN/ARN-118	A109C	Si	JANTX	AUF	71A	25.00000	0.440	--	2902	0	1.699572	--
1N5615	429	F-16 HUD	A109C	Si	JANTX	AIF	40A	25.00000	--	--	6604	0	3.592520	--
1N5617	429	AN/ARN-118	A248E	Si	JANTX	AUC	71A	25.00000	0.063	0.070	15862	5	14.985313	0.33366
1N5617	429	AN/ARN-118	A248E	Si	JANTX	AUC	71A	25.00000	0.063	0.070	4532	5	4.281518	1.16781
1N5617	429	AN/ARN-118	A248E	Si	JANTX	AUT	71A	25.00000	0.063	0.070	1880	4	2.763222	1.44759
1N5617	429	AN/ARN-118	A248E	Si	JANTX	AUB	71A	25.00000	0.063	0.070	2632	0	3.981166	--
1N5617	429	AN/ARN-118	A248E	Si	JANTX	AUB	71A	25.00000	0.063	0.070	752	0	1.137476	--
1N5617	429	AN/ARN-118	A248E	Si	JANTX	AUA	71A	25.00000	0.063	0.070	1302	1	1.009974	0.99012
1N5617	429	AN/ARN-118	A248E	Si	JANTX	AUA	71A	25.00000	0.063	0.070	4557	1	3.534909	0.28289
1N5617	429	AN/ARN-118	A248E	Si	JANTX	AUF	71A	25.00000	0.063	0.070	2902	0	1.696046	--
1N5617	429	AN/ARN-118	A248E	Si	JANTX	AUF	71A	25.00000	0.063	0.070	10157	4	5.948502	0.67244

Diode Section

Test Type : FIELD

Device : DIODE, RECTIFIER, BRIDGE, FULL WAVE

Part Number	Slash Number	Equipment Reference	Package Type	Semi-Material	Quality Level	App Env	Temp °C	Rated Current (A)	Voltage Stress	Current Stress	Parts Tested	Number Failed	Part Hours (E06)	Failure Rate (f/10E6 Hrs)
DA01-06A	--	F-16 HUD	--	Si	--	ATF	40A	--	--	--	1524	0	0.829055	--

Test Type : FIELD

Device : DIODE, ZENER

Part Number	Slash Number	Equipment Reference	Package Type	Semi-Material	Quality Level	App Env	Temp °C	Rated Current (A)	Voltage Stress	Current Stress	Parts Tested	Number Failed	Part Hours (E06)	Failure Rate (f/10E6 Hrs)
1N1597A	--	COMMERCIAL	D04	Si	LOWER	GB	40A	--	--	--	2518	0	3.273400	--
1N2163A	--	COMMERCIAL	A41J	Si	LOWER	GB	40A	--	--	--	38207	37	49.669100	0.74493
1N2500	--	COMMERCIAL	D04	Si	LOWER	GB	40A	--	--	--	3042	3	3.954600	0.75861
1N2620	--	COMMERCIAL	A31A	Si	LOWER	GB	40A	--	--	--	940	0	1.222000	--
1N2973B	124	COMMERCIAL	D04	Si	LOWER	GB	40A	--	--	--	7368	1	9.578400	0.10440
1N2973B	124	COMMERCIAL	D04	Si	LOWER	GB	40A	--	--	--	6114	1	7.948200	0.12581
1N2979	--	COMMERCIAL	D04	Si	LOWER	GB	40A	--	--	--	33	0	0.042900	--
1N2979B	124	COMMERCIAL	D04	Si	LOWER	GB	40A	--	--	--	26042	4	33.854600	0.11815
1N2979B	124	COMMERCIAL	D04	Si	LOWER	GB	40A	--	--	--	13578	3	17.651400	0.16996
1N2980B	124	COMMERCIAL	D04	Si	LOWER	GB	40A	--	--	--	32073	5	41.694900	0.11992
1N2980B	124	COMMERCIAL	D04	Si	LOWER	GB	40A	--	--	--	12559	1	16.326700	0.06125
1N2984B	124	COMMERCIAL	D04	Si	LOWER	GB	40A	--	--	--	22509	13	29.261700	0.44427
1N2984B	124	COMMERCIAL	D04	Si	LOWER	GB	40A	--	--	--	19882	7	25.846600	0.27083
1N2986B	124	COMMERCIAL	D04	Si	LOWER	GB	40A	--	--	--	687	0	0.893100	--
1N2986B	124	COMMERCIAL	D04	Si	LOWER	GB	40A	--	--	--	266	0	0.345800	--
1N4126	435	AN/BRD-7	D035	Si	JANTX	NSB	25A	--	--	--	420	0	1.333425	--
1N4958	356	AN/BRD-7	A248F	Si	JANTX	NSB	25A	--	--	--	392	0	1.244530	--
1N5524	437	COMMERCIAL	D0204	Si	PLASTIC	GB	40A	--	--	--	3620	0	4.706000	--
1N5525C	437	COMMERCIAL	D0204	Si	PLASTIC	GB	40A	--	--	--	32271	0	41.952300	--
1N5847A	--	COMMERCIAL	D07	Si	LOWER	GB	40A	--	--	--	29666	0	38.565800	--
1N5851B	--	COMMERCIAL	D07	Si	LOWER	GB	40A	--	--	--	980	0	1.274000	--
1N5856A	--	COMMERCIAL	D07	Si	LOWER	GB	40A	--	--	--	31136	0	40.476800	--
1N746	127	COMMERCIAL	D07	Si	PLASTIC	GB	40A	--	--	--	962	0	1.250600	--
1N754A	127	AN/BRD-7	D035	Si	JANTX	NSB	25A	--	--	--	644	0	2.044585	--
1N756	--	AN/BRD-7	D035	Si	JTX EQU	NSB	25A	--	--	--	28	0	0.088895	--
1N756A	127	AN/BRD-7	D035	Si	JANTX	NSB	25A	--	--	--	420	0	1.333425	--

Diode Section

Test Type : FIELD

Device : DIODE, ZENER (CONTINUED FROM PREVIOUS PAGE)

Part Number	Slash Number	Equipment Reference	Package Type	Semi. Material	Quality Level	App Env	Temp °C	Rated Current (A)	Voltage Stress	Current Stress	Parts Tested	Number Failed	Part Hours (E06)	Failure Rate (f/10E6 Hrs)
1N962B	117	AN/BRD-7	D035	Si	JANTX	NSB	25A	--	--	--	476	0	1.511215	--
1N963B	117	AN/BRD-7	D035	Si	JANTX	NSB	25A	--	--	--	448	1	1.422320	0.70308
1N965B	117	AN/BRD-7	D035	Si	JANTX	NSB	25A	--	--	--	224	0	0.711160	--
1N967B	117	AN/BRD-7	D035	Si	JANTX	NSB	25A	--	--	--	28	0	0.088895	--
1N968B	117	AN/BRD-7	D035	Si	JANTX	NSB	25A	--	--	--	56	0	0.177790	--
1N974B	117	AN/BRD-7	D035	Si	JANTX	NSB	25A	--	--	--	28	0	0.088895	--
1N9751A	--	COMMERCIAL	D035	Si	LOWER	GB	40A	--	--	--	42004	0	54.605200	--
MZ4620	--	AN/ARN-118	D07	Si	JTX EQU	AUC	71A	--	--	--	2266	0	2.140759	--
MZ4620	--	AN/ARN-118	D07	Si	JTX EQU	AUT	71A	--	--	--	940	0	1.381611	--
MZ4620	--	AN/ARN-118	D07	Si	JTX EQU	AUB	71A	--	--	--	376	0	0.568738	--
MZ4620	--	AN/ARN-118	D07	Si	JTX EQU	AUA	71A	--	--	--	651	0	0.504987	--
MZ4620	--	AN/ARN-118	D07	Si	JTX EQU	AUF	71A	--	--	--	1451	0	0.849786	--
MZ4626	--	AN/ARN-118	D07	Si	JTX EQU	AUC	71A	--	--	--	4532	2	4.281518	0.46712
MZ4626	--	AN/ARN-118	D07	Si	JTX EQU	AUT	71A	--	--	--	1880	0	2.763222	--
MZ4626	--	AN/ARN-118	D07	Si	JTX EQU	AUB	71A	--	--	--	752	0	1.137476	--
MZ4626	--	AN/ARN-118	D07	Si	JTX EQU	AUA	71A	--	--	--	1302	0	1.009974	--
MZ4626	--	AN/ARN-118	D07	Si	JTX EQU	AUF	71A	--	--	--	2902	0	1.696046	--

Test Type : FIELD

Device : DIODE, ZENER, VOLTAGE REGULATOR

Part Number	Slash Number	Equipment Reference	Package Type	Semi. Material	Quality Level	App Env	Temp °C	Rated Current (A)	Voltage Stress	Current Stress	Parts Tested	Number Failed	Part Hours (E06)	Failure Rate (f/10E6 Hrs)
1N3020B	115	AN/BRD-7	D013	Si	JANTX	NSB	25A	--	--	--	168	0	0.533370	--
1N3031B	115	AN/ARN-118	A31A	Si	JANTX	AUC	71A	--	--	--	2266	0	2.140759	--
1N3031B	115	AN/ARN-118	A31A	Si	JANTX	AUT	71A	--	--	--	940	0	1.381611	--
1N3031B	115	AN/ARN-118	A31A	Si	JANTX	AUB	71A	--	--	--	376	0	0.568738	--
1N3031B	115	AN/ARN-118	A31A	Si	JANTX	AUA	71A	--	--	--	651	0	0.504987	--
1N3031B	115	AN/ARN-118	A31A	Si	JANTX	AUF	71A	--	--	--	1451	0	0.849786	--
1N3032B	115	AN/BRD-7	D013	Si	JANTX	NSB	25A	--	--	--	224	0	0.711160	--
1N3046	115	AN/ARN-118	A31A	Si	JANTX	AUC	71A	--	--	--	2266	1	2.140759	0.46712

Diode Section

Test Type : FIELD

Device : DIODE, ZENER, VOLTAGE REGULATOR (CONTINUED FROM PREVIOUS PAGE)

Part Number	Slash Number	Equipment Reference	Package Type	Semi. Material	Quality Level	App Env	Temp °C	Rated Current (A)	Voltage Stress	Current Stress	Parts Tested	Number Failed	Part Hours (E06)	Failure Rate (f/10E6 Hrs)
1N3046	115	AN/ARN-118	A31A	Si	JANTX	AUT	71A	--	--	--	940	1	1.381611	0.72379
1N3046	115	AN/ARN-118	A31A	Si	JANTX	AUB	71A	--	--	--	376	1	0.568738	1.75828
1N3046	115	AN/ARN-118	A31A	Si	JANTX	AUA	71A	--	--	--	651	0	0.504987	--
1N3046	115	AN/ARN-118	A31A	Si	JANTX	AUF	71A	--	--	--	1451	1	0.849786	1.17677
1N3828A	115	AN/BRO-7	DO13	Si	JANTX	NSB	25A	--	--	--	112	0	0.355580	--
1N4466	406	F-16 FCC	A1V	Si	JANTX	AIF	40A	--	--	--	487	1	0.212577	4.70418
1N4468	406	F-16 FCC	A1V	Si	JANTX	AIF	40A	--	--	--	487	0	0.212577	--
1N4474	406	F-16 HUD	A1V	Si	JANTX	AIF	40A	--	--	--	140	0	0.076234	--
1N4562B	114	AN/ARN-118	T03	Si	JANTX	AUC	71A	--	--	--	6798	1	6.422277	0.15571
1N4562B	114	AN/ARN-118	T03	Si	JANTX	AUT	71A	--	--	--	2820	0	4.144833	--
1N4562B	114	AN/ARN-118	T03	Si	JANTX	AUB	71A	--	--	--	1128	0	1.706214	--
1N4562B	114	AN/ARN-118	T03	Si	JANTX	AUA	71A	--	--	--	1953	0	1.514961	--
1N4562B	114	AN/ARN-118	T03	Si	JANTX	AUF	71A	--	--	--	4353	2	2.549358	0.78451
1N4960	356	F-16 FCC	A248F	Si	JANTX	AIF	40A	--	--	--	487	0	0.212577	--
1N4961	356	F-16 HUD	A248F	Si	JANTX	AIF	40A	--	--	--	508	1	0.276358	3.61849
1N4969	356	AN/ARN-118	A248F	Si	JANTX	AUC	71A	--	--	--	4532	1	4.281518	0.23356
1N4969	356	AN/ARN-118	A248F	Si	JANTX	AUT	71A	--	--	--	1880	1	2.763222	0.36190
1N4969	356	AN/ARN-118	A248F	Si	JANTX	AUB	71A	--	--	--	752	0	1.137476	--
1N4969	356	AN/ARN-118	A248F	Si	JANTX	AUA	71A	--	--	--	1302	0	1.009974	--
1N4969	356	AN/ARN-118	A248F	Si	JANTX	AUF	71A	--	--	--	2902	0	1.696046	--
1N5338A	--	COMMERCIAL	A1EE	Si	PLASTIC	GB	40A	--	--	--	18593	2	24.170900	0.08274
1N5340B	--	COMMERCIAL	A1EE	Si	PLASTIC	GB	40A	--	--	--	175675	33	228.377500	0.14450
1N5342B	--	COMMERCIAL	A1EE	Si	PLASTIC	GB	40A	--	--	--	10094	0	13.122200	--
1N5351B	--	COMMERCIAL	A1EE	Si	PLASTIC	GB	40A	--	--	--	107602	22	139.882600	0.15727
1N5354B	--	COMMERCIAL	A1EE	Si	PLASTIC	GB	40A	--	--	--	193998	97	252.197400	0.38462
1N5357B	--	COMMERCIAL	A1EE	Si	PLASTIC	GB	40A	--	--	--	22690	2	29.497000	0.06780
1N5358B	--	COMMERCIAL	A1EE	Si	PLASTIC	GB	40A	--	--	--	21223	2	27.589900	0.07249
1N5363B	--	COMMERCIAL	A1EE	Si	PLASTIC	GB	40A	--	--	--	91373	34	118.784900	0.28623
1N5365	--	COMMERCIAL	A1EE	Si	PLASTIC	GB	40A	--	--	--	1658	0	2.155400	--
1N5370B	--	AN/ARN-118	A1EE	Si	JTX EQU	AUC	71A	--	--	--	2266	0	2.140759	--
1N5370B	--	AN/ARN-118	A1EE	Si	JTX EQU	AUT	71A	--	--	--	940	0	1.381611	--
1N5370B	--	AN/ARN-118	A1EE	Si	JTX EQU	AUB	71A	--	--	--	376	0	0.568738	--
1N5370B	--	AN/ARN-118	A1EE	Si	JTX EQU	AUA	71A	--	--	--	651	0	0.504987	--

Diode Section

Test Type : FIELD

Device : DIODE, ZENER, VOLTAGE REGULATOR (CONTINUED FROM PREVIOUS PAGE)

Part Number	Slash Number	Equipment Reference	Package Type	Semi. Material	Quality Level	App Env	Temp °C	Rated Current (A)	Voltage Stress	Current Stress	Parts Tested	Number Failed	Part Hours (E06)	Failure Rate (f/10E6 Hrs)
1N5370B	--	AN/ARN-118	A1EE	Si	JTX EQU	AUF	71A	--	--	--	1451	0	0.849786	--
1N746A	127	AN/ARN-118	D07	Si	JANTX	AIC	55A	--	--	--	2266	1	2.140759	0.46712
1N746A	127	AN/ARN-118	D07	Si	JANTX	AIT	55A	--	--	--	940	0	2.691398	--
1N746A	127	AN/ARN-118	D07	Si	JANTX	AIB	55A	--	--	--	376	0	0.568738	--
1N746A	127	AN/ARN-118	D07	Si	JANTX	AIA	55A	--	--	--	651	0	0.504987	--
1N746A	127	AN/ARN-118	D07	Si	JANTX	AIF	55A	--	--	--	1451	0	0.848317	--
1N746A	127	AN/ARN-118	D07	Si	JANTX	AUC	71A	--	--	--	4532	0	4.281518	--
1N746A	127	AN/ARN-118	D07	Si	JANTX	AUC	71A	--	--	--	15862	0	14.985313	--
1N746A	127	AN/ARN-118	D07	Si	JANTX	AUT	71A	--	--	--	1880	0	2.763222	--
1N746A	127	AN/ARN-118	D07	Si	JANTX	AUT	71A	--	--	--	6580	0	9.671277	--
1N746A	127	AN/ARN-118	D07	Si	JANTX	AUB	71A	--	--	--	2632	0	3.981166	--
1N746A	127	AN/ARN-118	D07	Si	JANTX	AUB	71A	--	--	--	752	0	1.137476	--
1N746A	127	AN/ARN-118	D07	Si	JANTX	AUA	71A	--	--	--	1302	0	1.009974	--
1N746A	127	AN/ARN-118	D07	Si	JANTX	AUA	71A	--	--	--	4557	1	3.534909	0.28289
1N746A	127	AN/ARN-118	D07	Si	JANTX	AUF	71A	--	--	--	10157	0	5.948502	--
1N746A	127	AN/ARN-118	D07	Si	JANTX	AUF	71A	--	--	--	2902	0	1.696046	--
1N746A	127	AN/BRD-7	D07	Si	JANTX	NSB	25A	--	--	--	84	0	0.266685	--
1N748A	127	F-16 HUD	A1	Si	JANTX	AIF	40A	--	--	--	1016	0	0.552697	--
1N748A	127	AN/BRD-7	A1	Si	JANTX	NSB	25A	--	--	--	364	0	1.155635	--
1N749A	127	AN/ARN-118	A1	Si	JANTX	AUC	71A	--	--	--	2266	0	2.140759	--
1N749A	127	AN/ARN-118	A1	Si	JANTX	AUB	71A	--	--	--	376	0	0.568738	--
1N749A	127	AN/ARN-118	A1	Si	JANTX	AUA	71A	--	--	--	651	0	0.504987	--
1N749A	127	AN/ARN-118	A1	Si	JANTX	AUF	71A	--	--	--	1451	0	0.848023	--
1N749A	127	AN/BRD-7	A1	Si	JANTX	NSB	25A	--	--	--	28	0	0.088895	--
1N750A	127	AN/ARN-118	D07	Si	JANTX	AUC	71A	--	--	--	2266	1	2.140759	0.46712
1N750A	127	AN/ARN-118	D07	Si	JANTX	AUT	71A	--	--	--	940	0	1.381611	--
1N750A	127	AN/ARN-118	D07	Si	JANTX	AUB	71A	--	--	--	376	0	0.568738	--
1N750A	127	AN/ARN-118	D07	Si	JANTX	AUA	71A	--	--	--	651	0	0.504987	--
1N750A	127	AN/ARN-118	D07	Si	JANTX	AUF	71A	--	--	--	1451	0	0.849786	--
1N750A	127	AN/BRD-7	D07	Si	JANTX	NSB	25A	--	--	--	112	0	0.355580	--
1N751-1	127	F-16 FCC	A1	Si	JANTX	AIF	40A	--	--	--	18506	0	8.077900	--

Diode Section

Test Type : FIELD

Device : DIODE, ZENER, VOLTAGE REGULATOR (CONTINUED FROM PREVIOUS PAGE)

Part Number	Slash Number	Equipment Reference	Package Type	Semi. Material	Quality Level	App Env	Temp °C	Rated Current (A)	Voltage Stress	Current Stress	Parts Tested	Number Failed	Part Hours	Failure Rate (f/10E6 Hrs)
1N751A	127	AN/ARN-118	A1	Si	JANTX	AUC	71A	--	--	--	4532	0	4.281518	--
1N751A	127	AN/ARN-118	A1	Si	JANTX	AUT	71A	--	--	--	1880	0	2.763222	--
1N751A	127	AN/ARN-118	A1	Si	JANTX	AUB	71A	--	--	--	752	0	1.137476	--
1N751A	127	AN/ARN-118	A1	Si	JANTX	AUA	71A	--	--	--	1302	0	1.009974	--
1N751A	127	AN/ARN-118	A1	Si	JANTX	AUF	71A	--	--	--	2902	0	1.699572	--
1N751A	127	F-16 HUD	A1	Si	JANTX	AIF	40A	--	--	--	2032	0	1.105397	--
1N751A	127	AN/BRD-7	A1	Si	JANTX	ASB	25A	--	--	--	504	1	1.600090	0.62496
1N752A	127	AN/ARN-118	A1	Si	JANTX	AIC	55A	--	--	--	6798	2	6.422277	0.31142
1N752A	127	AN/ARN-118	A1	Si	JANTX	AIT	55A	--	--	--	2820	0	8.074194	--
1N752A	127	AN/ARN-118	A1	Si	JANTX	AIB	55A	--	--	--	1128	0	1.706214	--
1N752A	127	AN/ARN-118	A1	Si	JANTX	AIA	55A	--	--	--	1953	0	1.514961	--
1N752A	127	AN/ARN-118	A1	Si	JANTX	AIF	55A	--	--	--	4353	0	2.544951	--
1N752A	127	AN/ARN-118	A1	Si	JANTX	AUC	71A	--	--	--	2266	0	2.140759	--
1N752A	127	AN/ARN-118	A1	Si	JANTX	AUT	71A	--	--	--	940	0	1.381611	--
1N752A	127	AN/ARN-118	A1	Si	JANTX	AUB	71A	--	--	--	376	0	0.568738	--
1N752A	127	AN/ARN-118	A1	Si	JANTX	AUA	71A	--	--	--	651	1	0.504987	1.98025
1N752A	127	AN/ARN-118	A1	Si	JANTX	AUF	71A	--	--	--	1451	1	0.849786	1.17677
1N752A	127	F-16 HUD	A1	Si	JANTX	AIF	40A	--	--	--	508	1	0.276358	3.61849
1N752A	127	AN/BRD-7	A1	Si	JANTX	ASB	25A	--	--	--	392	0	1.244530	--
1N753	127	AN/ARN-118	D07	Si	JANTX	AUC	71A	--	--	--	2266	0	2.140759	--
1N753	127	AN/ARN-118	D07	Si	JANTX	AUT	71A	--	--	--	940	0	1.381611	--
1N753	127	AN/ARN-118	D07	Si	JANTX	AUB	71A	--	--	--	376	0	0.568738	--
1N753	127	AN/ARN-118	D07	Si	JANTX	AUB	71A	--	--	--	376	0	0.568738	--
1N753	127	AN/ARN-118	D07	Si	JANTX	AUA	71A	--	--	--	651	0	0.504987	--
1N753	127	AN/ARN-118	D07	Si	JANTX	AUF	71A	--	--	--	1451	0	0.849786	--
1N753A	127	AN/ARN-118	A1	Si	JANTX	AUC	71A	--	--	--	13596	0	12.844554	--
1N753A	127	AN/ARN-118	A1	Si	JANTX	AUT	71A	--	--	--	5640	0	8.289666	--
1N753A	127	AN/ARN-118	A1	Si	JANTX	AUB	71A	--	--	--	2256	0	3.412428	--
1N753A	127	AN/ARN-118	A1	Si	JANTX	AUA	71A	--	--	--	3906	0	3.029922	--
1N753A	127	AN/ARN-118	A1	Si	JANTX	AUF	71A	--	--	--	8706	0	5.098716	--
1N753A	127	F-16 HUD	A1	Si	JANTX	AIF	40A	--	--	--	1016	0	0.552698	--
1N753A	127	AN/BRD-7	A1	Si	JANTX	ASB	25A	--	--	--	700	0	2.222375	--
1N755A	127	F-16 HUD	D07	Si	JANTX	AIF	40A	--	--	--	2540	0	1.381752	--

Diode Section

Test Type : FIELD

Device : DIODE, ZENER, VOLTAGE REGULATOR (CONTINUED FROM PREVIOUS PAGE)

Part Number	Slash Number	Equipment Reference	Package Type	Semi. Material	Quality Level	App Env	Temp °C	Rated Current (A)	Voltage Stress	Current Stress	Parts Tested	Number Failed	Part Hours (E06)	Failure Rate (f/10E6 Hrs)
1N755A	127	AN/BRD-7	D07	Si	JANTX	NSB	25A	--	--	--	196	0	0.622265	--
1N757A	127	AN/ARN-118	D07	Si	JANTX	AUC	71A	--	--	--	2266	0	2.140759	--
1N757A	127	AN/ARN-118	D07	Si	JANTX	AUT	71A	--	--	--	940	0	1.381611	--
1N757A	127	AN/ARN-118	D07	Si	JANTX	AUB	71A	--	--	--	376	0	0.568738	--
1N757A	127	AN/ARN-118	D07	Si	JANTX	AUA	71A	--	--	--	651	0	0.504987	--
1N757A	127	AN/ARN-118	D07	Si	JANTX	AUF	71A	--	--	--	1451	0	0.849786	--
1N757A	127	AN/BRD-7	D07	Si	JANTX	NSB	25A	--	--	--	28	0	0.088895	--
1N758A	127	AN/ARN-118	D07	Si	JANTX	AUC	71A	--	--	--	2266	0	2.140759	--
1N758A	127	AN/ARN-118	D07	Si	JANTX	AUT	71A	--	--	--	940	0	1.381611	--
1N758A	127	AN/ARN-118	D07	Si	JANTX	AUB	71A	--	--	--	376	0	0.568738	--
1N758A	127	AN/ARN-118	D07	Si	JANTX	AUA	71A	--	--	--	651	0	0.504987	--
1N758A	127	AN/ARN-118	D07	Si	JANTX	AUF	71A	--	--	--	1451	0	0.849786	--
1N758A	127	F-16 HUD	D07	Si	JANTX	AIF	40A	--	--	--	1016	4	0.552697	7.23724
1N758A	127	F-16 FCC	D07	Si	JANTX	AIF	40A	--	--	--	3896	0	1.700600	--
1N759A-1	127	F-16 FCC	1C5242	Si	JANTX	AIF	40A	--	--	--	3896	0	1.700600	--
1N825	159	F-16 HUD	D07	Si	JANTX	AIF	40A	--	--	--	508	0	0.276358	--
1N825	159	COMMERCIAL	D07	Si	PLASTIC	GB	40A	--	--	--	950609	138	1235.791700	0.11167
1N938B	156	AN/BRD-7	D07	Si	JANTX	NSB	25A	--	--	--	168	0	0.533370	--
1N970B	117	AN/ARN-118	A398A	Si	JANTX	AUC	71A	--	--	--	2266	1	2.140759	0.46712
1N970B	117	AN/ARN-118	A398A	Si	JANTX	AUT	71A	--	--	--	940	0	1.381611	--
1N970B	117	AN/ARN-118	A398A	Si	JANTX	AUB	71A	--	--	--	376	1	0.568738	1.75828
1N970B	117	AN/ARN-118	A398A	Si	JANTX	AUA	71A	--	--	--	651	0	0.504987	--
1N970B	117	AN/ARN-118	A398A	Si	JANTX	AUF	71A	--	--	--	1451	0	0.849786	--
1N972B	117	AN/ARN-118	D07	Si	JANTX	AUC	71A	--	--	--	2266	2	2.140759	0.93425
1N972B	117	AN/ARN-118	D07	Si	JANTX	AUT	71A	--	--	--	940	0	1.381611	--
1N972B	117	AN/ARN-118	D07	Si	JANTX	AUB	71A	--	--	--	376	0	0.568738	--
1N972B	117	AN/ARN-118	D07	Si	JANTX	AUA	71A	--	--	--	651	0	0.504987	--
1N972B	117	AN/ARN-118	D07	Si	JANTX	AUF	71A	--	--	--	1451	0	0.849786	--
1N972B	117	AN/BRD-7	D07	Si	JANTX	NSB	25A	--	--	--	56	0	0.777790	--
1N973B	117	AN/ARN-118	A398A	Si	JANTX	AUC	71A	--	--	--	2266	0	2.140759	--
1N973B	117	AN/ARN-118	A398A	Si	JANTX	AUT	71A	--	--	--	940	0	1.381611	--

Diode Section

Test Type : FIELD

Device : DIODE, ZENER, VOLTAGE REGULATOR (CONTINUED FROM PREVIOUS PAGE)

Part Number	Slash Number	Equipment Reference	Package Type	Semi. Material	Quality Level	App Env	Temp °C	Rated Current (A)	Voltage Stress	Current Stress	Parts Tested	Number Failed	Part Hours (E06)	Failure Rate (f/10E6 Hrs)
1N973B	117	AN/ARN-118	A398A	Si	JANTX	AUB	71A	--	--	--	376	0	0.568738	--
1N973B	117	AN/ARN-118	A398A	Si	JANTX	AUA	71A	--	--	--	651	0	0.504987	--
1N973B	117	AN/ARN-118	A398A	Si	JANTX	AUF	71A	--	--	--	1451	0	0.849786	--
1N983B	117	F-16 HUD	D07	Si	JANTX	A1F	40A	--	--	--	508	5	0.276358	18.09247
1N992B	117	F-16 HUD	D07	Si	JANTX	A1F	40A	--	--	--	1016	0	0.552697	--

Test Type : FIELD

Device : DIODE, ZENER, VOLTAGE REFERENCE

Part Number	Slash Number	Equipment Reference	Package Type	Semi. Material	Quality Level	App Env	Temp °C	Rated Current (A)	Voltage Stress	Current Stress	Parts Tested	Number Failed	Part Hours (E06)	Failure Rate (f/10E6 Hrs)
1N2971RA	124	COMMERCIAL	D04	Si	LOWER	GB	40A	--	--	--	7531	2	9.790300	0.20428
1N2971RA	124	COMMERCIAL	D04	Si	LOWER	GB	40A	--	--	--	2855	1	3.711500	0.26943
1N2971RB	--	COMMERCIAL	D04	Si	LOWER	GB	40A	--	--	--	4	0	0.005200	--
1N2995B	--	COMMERCIAL	D04	Si	LOWER	GB	40A	--	--	--	4	0	0.005200	--
1N3996A	272	COMMERCIAL	D04	Si	LOWER	GB	40A	--	--	--	3790	0	4.927000	--
1N3996A	272	COMMERCIAL	D04	Si	LOWER	GB	40A	--	--	--	160	0	0.208000	--
1N3997AR	272	COMMERCIAL	D04	Si	LOWER	GB	40A	--	--	--	53289	7	69.275700	0.10105
1N3997AR	272	COMMERCIAL	D04	Si	LOWER	GB	40A	--	--	--	22777	5	29.610100	0.16886
1N3998A	272	COMMERCIAL	D04	Si	LOWER	GB	40A	--	--	--	3164	1	4.113200	0.24312
1N3998A	272	COMMERCIAL	D04	Si	LOWER	GB	40A	--	--	--	1783	0	2.317900	--
1N4000A	272	COMMERCIAL	D04	Si	LOWER	GB	40A	--	--	--	1970	0	2.561000	--
1N4000A	272	COMMERCIAL	D04	Si	LOWER	GB	40A	--	--	--	602	0	0.782600	--
1N4099	--	COMMERCIAL	D07	Si	LOWER	GB	40A	--	--	--	6200	0	8.060000	--
1N4099	--	COMMERCIAL	D07	Si	LOWER	GB	40A	--	--	--	1805	0	2.346500	--
1N4100	--	COMMERCIAL	D07	Si	LOWER	GB	40A	--	--	--	9922	2	12.898600	0.15506
1N4100	--	COMMERCIAL	D07	Si	LOWER	GB	40A	--	--	--	3462	0	4.500600	--
1N4103	--	COMMERCIAL	D07	Si	LOWER	GB	40A	--	--	--	38406	2	49.927800	0.04006
1N4103	--	COMMERCIAL	D07	Si	LOWER	GB	40A	--	--	--	18109	1	23.541700	0.04248
1N4104	--	COMMERCIAL	D07	Si	*LOWER	GB	40A	--	--	--	55873	2	72.634900	0.02753
1N4104	--	COMMERCIAL	D07	Si	LOWER	GB	40A	--	--	--	41468	2	53.908400	0.03710
1N4105	--	COMMERCIAL	D07	Si	LOWER	GB	40A	--	--	--	74	0	0.096200	--
1N4110	--	COMMERCIAL	D07	Si	LOWER	GB	40A	--	--	--	1894	0	2.462200	--

Diode Section

Test Type : FIELD

Device : DIODE, ZENER, VOLTAGE REFERENCE (CONTINUED FROM PREVIOUS PAGE)

Part Number	Slash Number	Equipment Reference	Package Type	Semi. Material	Quality Level	App Env	Temp °C	Rated Current (A)	Voltage Stress	Current Stress	Parts Tested	Number Failed	Part Hours	Failure Rate (f/10E6 Hrs)
1N4110	--	COMMERCIAL	D07	Si	LOWER	GB	40A	--	--	--	707	0	0.919100	--
1N4462	406	AN/BRD-7	A1V	Si	JANTX	NSB	25A	--	--	--	28	0	0.088895	--
1N4465	406	AN/BRD-7	A1V	Si	JANTX	NSB	25A	--	--	--	112	0	0.355580	--
1N4472	406	AN/BRD-7	A1V	Si	JANTX	NSB	25A	--	--	--	140	0	0.444475	--
1N4566A	--	F-16 FCC	D07	Si	JANTX	AIF	40A	--	--	--	487	0	0.212577	--
1N4746A	--	AN/ARN-118	D041	Si	JTX EQU	AUC	71A	--	--	--	4532	0	4.281518	--
1N4746A	--	AN/ARN-118	D041	Si	JTX EQU	AUT	71A	--	--	--	1880	0	2.763222	--
1N4746A	--	AN/ARN-118	D041	Si	JTX EQU	AUB	71A	--	--	--	752	0	1.137476	--
1N4746A	--	AN/ARN-118	D041	Si	JTX EQU	AUA	71A	--	--	--	1302	0	1.009974	--
1N4746A	--	AN/ARN-118	D041	Si	JTX EQU	AUF	71A	--	--	--	2902	0	1.699572	--
1N4766	--	AN/ARN-118	D07	Si	JTX EQU	AUC	71A	--	--	--	4532	0	4.281518	--
1N4766	--	AN/ARN-118	D07	Si	JTX EQU	AUT	71A	--	--	--	1880	0	2.763222	--
1N4766	--	AN/ARN-118	D07	Si	JTX EQU	AUB	71A	--	--	--	752	1	1.137476	0.87914
1N4766	--	AN/ARN-118	D07	Si	JTX EQU	AUA	71A	--	--	--	1302	0	1.009974	--
1N4766	--	AN/ARN-118	D07	Si	JTX EQU	AUF	71A	--	--	--	2902	0	1.699572	--
1N821	159	F-16 HUD	D07	Si	JANTX	AIF	40A	--	--	--	508	0	0.276348	--
1N821	159	AN/BRD-7	D07	Si	JANTX	NSB	25A	--	--	--	308	0	0.977845	--
1N821	159	COMMERCIAL	D07	Si	PLASTIC	GB	40A	--	--	--	384143	78	499.385900	0.15619
1N821A	159	AN/ARN-118	D07	Si	JANTX	AUC	71A	--	--	--	2266	0	2.140759	--
1N821A	159	AN/ARN-118	D07	Si	JANTX	AUT	71A	--	--	--	940	0	1.381611	--
1N821A	159	AN/ARN-118	D07	Si	JANTX	AUB	71A	--	--	--	376	0	0.568738	--
1N821A	159	AN/ARN-118	D07	Si	JANTX	AUA	71A	--	--	--	651	0	0.504987	--
1N821A	159	AN/ARN-118	D07	Si	JANTX	AUF	71A	--	--	--	1451	0	0.849786	--
1N823	--	COMMERCIAL	D07	Si	PLASTIC	GB	40A	--	--	--	301411	39	391.834300	0.09953
1N827	--	AN/BRD-7	D07	Si	JANTX	NSB	25A	--	--	--	532	0	1.689005	--
1N827	--	COMMERCIAL	D07	Si	PLASTIC	GB	40A	--	--	--	476074	34	618.896200	0.05494
1N829	159	F-16 HUD	D07	Si	JANTX	AIF	40A	--	--	--	508	0	0.276358	--
1N829	159	COMMERCIAL	D07	Si	PLASTIC	GB	40A	--	--	--	137421	10	178.647300	0.05598
1N936	--	COMMERCIAL	D07	Si	PLASTIC	GB	40A	--	--	--	64635	21	84.025500	0.24992
1N937	--	COMMERCIAL	D07	Si	PLASTIC	GB	40A	--	--	--	141116	34	183.450800	0.18534
1N938	--	COMMERCIAL	D07	Si	PLASTIC	GB	40A	--	--	--	34301	7	44.591300	0.15698

Diode Section

Test Type : FIELD

Device : DIODE, ZENER, VOLTAGE REFERENCE (CONTINUED FROM PREVIOUS PAGE)

Part Number	Slash Number	Equipment Reference	Package Type	Semi. Material	Quality Level	App Env	Temp °C	Rated Current (A)	Voltage Stress	Current Stress	Parts Tested	Number Failed	Part Hours (E06)	Failure Rate (f/10E6 Hrs)
1N938A	--	COMMERCIAL	D07	Si	PLASTIC	GB	40A	--	--	--	96	0	0.124800	--
1N941	--	COMMERCIAL	D07	Si	PLASTIC	GB	40A	--	--	--	29345	3	38.148500	0.07864
1N942	--	COMMERCIAL	D07	Si	PLASTIC	GB	40A	--	--	--	1614	0	2.098200	--
1N943	--	COMMERCIAL	D07	Si	PLASTIC	GB	40A	--	--	--	4018	0	5.223400	--
1N944	--	COMMERCIAL	D07	Si	PLASTIC	GB	40A	--	--	--	29060	2	37.778000	0.05294

Test Type : FIELD

Device : DIODE, CURRENT REGULATOR

Part Number	Slash Number	Equipment Reference	Package Type	Semi. Material	Quality Level	App Env	Temp °C	Rated Current (A)	Voltage Stress	Current Stress	Parts Tested	Number Failed	Part Hours (E06)	Failure Rate (f/10E6 Hrs)
1N5305	--	COMMERCIAL	D07	Si	PLASTIC	GB	40A	0.00200	--	--	9342	2	12.144600	0.16468

Test Type : FIELD

Device : DIODE, SUPPRESSOR, TRANSIENT

Part Number	Slash Number	Equipment Reference	Package Type	Semi. Material	Quality Level	App Env	Temp °C	Rated Current (A)	Voltage Stress	Current Stress	Parts Tested	Number Failed	Part Hours (E06)	Failure Rate (f/10E6 Hrs)
1N5555	434	AN/ARN-118	D013	Si	JANTX	AUC	71A	32.00000	--	--	2266	1	2.140759	0.46712
1N5555	434	AN/ARN-118	D013	Si	JANTX	AUT	71A	32.00000	--	--	940	0	1.381611	--
1N5555	434	AN/ARN-118	D013	Si	JANTX	AUB	71A	32.00000	--	--	376	0	0.568738	--
1N5555	434	AN/ARN-118	D013	Si	JANTX	AUA	71A	32.00000	--	--	651	1	0.504987	1.98025
1N5555	434	AN/ARN-118	D013	Si	JANTX	AUC	71A	32.00000	--	--	1451	4	0.848023	4.71685
1N5555	434	F-16 FCC	D013	Si	JANTX	AIF	40A	32.00000	--	--	1948	1	0.850308	1.17604
1N5556	434	F-16 FCC	D07	Si	JANTX	AIF	40A	32.00000	--	--	1948	0	0.850308	--

Test Type : FIELD

Device : DIODE, MICROWAVE, TUNNEL

Part Number	Slash Number	Equipment Reference	Package Type	Semi. Material	Quality Level	App Env	Temp °C	Rated Current (A)	Voltage Stress	Current Stress	Freq. Band	Parts Tested	Number Failed	Part Hours (E06)	Failure Rate (f/10E6 Hrs)
1N3712	--	COMMERCIAL	A82A	Ge	LOWER	GB	40A	0.00500	--	--	--	38090	19	49.517000	0.38371
1N3713	--	COMMERCIAL	A82A	Ge	LOWER	GB	40A	0.00500	--	--	--	81647	39	106.141100	0.36744

Diode Section

Test Type : FIELD

Device : DIODE, MICROWAVE, TUNNEL (CONTINUED FROM PREVIOUS PAGE)

Part Number	Slash Number	Equipment Reference	Package Type	Semi. Material	Quality Level	App Env	Temp Oc	Rated Current (A)	Voltage Stress	Current Stress	Freq. Band	Parts Tested	Number Failed	Part Hours (E06)	Failure Rate (f/10E6 Hrs)
1N3714	--	COMMERCIAL	A82A	Ge	LOWER	GB	40A	0.01000	--	--	--	13982	4	18.176600	0.22006
1N3716	--	COMMERCIAL	A82A	Ge	LOWER	GB	40A	0.02500	--	--	--	4915	1	6.389500	0.15651
1N3717	--	COMMERCIAL	A82A	Ge	LOWER	GB	40A	0.02500	--	--	--	1	0	0.001300	--
1N3718	--	COMMERCIAL	A82A	Ge	LOWER	GB	40A	0.05000	--	--	--	39728	9	51.646400	0.17426
1N3719	--	COMMERCIAL	A82A	Ge	LOWER	GB	40A	0.05000	--	--	--	36	0	0.046800	--
1N3721	--	COMMERCIAL	A82A	Ge	LOWER	GB	40A	0.10000	--	--	--	1	0	0.001300	--

Test Type : TEST

Device : DIODE, MICROWAVE, SCHOTTKY BARRIER

Part Number	Slash Number	Equipment Reference	Package Type	Semi. Material	Quality Level	App Env	Temp Oc	Rated Current (A)	Voltage Stress	Current Stress	Freq. Band	Parts Tested	Number Failed	Part Hours (E06)	Failure Rate (f/10E6 Hrs)
--	--	N/A	--	Si	--	---	210A	--	--	--	--	50	10	0.263073	38.01226
--	--	N/A	--	Si	--	---	270A	--	--	--	--	50	23	0.108807	211.38346
--	--	N/A	--	Si	--	---	240A	--	--	--	--	50	16	0.263153	60.80113
--	--	N/A	--	GaAs	--	---	136J	--	--	--	--	--	0	0.413330	--
--	--	N/A	--	GaAs	--	---	141J	--	--	--	--	--	0	0.091239	--

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Test Type : FIELD

Device : DIODE, MICROWAVE, SCHOTTKY BARRIER

Part Number	Slash Number	Equipment Reference	Package Type	Semi. Material	Quality Level	App Env	Temp Oc	Rated Current (A)	Voltage Stress	Current Stress	Freq. Band	Parts Tested	Number Failed	Part Hours (E06)	Failure Rate (f/10E6 Hrs)
5082-2835	--	AN/ARN-118	D015	--	JTX EQU	AUC	71A	--	--	--	--	33990	1	32.111385	0.03114
5082-2835	--	AN/ARN-118	D015	--	JTX EQU	AUT	71A	--	--	--	--	14100	3	20.724165	0.14476
5082-2835	--	AN/ARN-118	D015	--	JTX EQU	AUB	71A	--	--	--	--	5640	0	8.531070	--
5082-2835	--	AN/ARN-118	D015	--	JTX EQU	AUA	71A	--	--	--	--	9765	0	7.574805	--
5082-2835	--	AN/ARN-118	D015	--	JTX EQU	AUF	71A	--	--	--	--	21765	2	12.746790	0.15690

RAC Discrete Semiconductor Device Database

Diode Section

Test Type : FIELD

Device : DIODE, MICROWAVE, PIN

Part Number	Slash Number	Equipment Reference	Package Type	Semi-Material	Quality Level	App Env	Temp °C	Rated Current (A)	Voltage Stress	Current Stress	Freq. Band	Parts Tested	Number Failed	Part Hours (E06)	Failure Rate (f/10E6 Hrs)
914275-1	--	PAVE PAWS	--	Si	JTX EQU	GF	40A	--	--	--	--	28800	10	663.520000	0.01507
914276	--	PAVE PAWS	--	Si	JTX EQU	GF	40A	--	--	--	--	7200	23	1658.790000	0.01387
914277-1	--	PAVE PAWS	--	Si	JTX EQU	GF	40A	--	--	--	--	115200	498	2654.070000	0.18764

Test Type : FIELD

Device : DIODE, MICROWAVE, VARIABLE CAPACITANCE (VARACTOR)

Part Number	Slash Number	Equipment Reference	Package Type	Semi-Material	Quality Level	App Env	Temp °C	Rated Current (A)	Voltage Stress	Current Stress	Freq. Band	Parts Tested	Number Failed	Part Hours (E06)	Failure Rate (f/10E6 Hrs)
1N4808	--	COMMERCIAL	D014	Si	PLASTIC	GB	40A	--	--	--	--	854	0	1.110200	--
1N4813B	329	AN/BRD-7	D014	Si	JANTX	NSB	25A	0.10000	--	--	--	392	0	1.244530	--
1N5137	--	COMMERCIAL	D07	Si	PLASTIC	GB	40A	0.25000	--	--	--	39117	8	50.852100	0.15732
1N5140	--	COMMERCIAL	D07	Si	PLASTIC	GB	40A	0.25000	--	--	--	1754	0	2.280200	--
1N5140A	--	COMMERCIAL	D07	Si	PLASTIC	GB	40A	0.25000	--	--	--	4340	4	5.642000	0.70897
1N5141	--	COMMERCIAL	D07	Si	PLASTIC	GB	40A	0.25000	--	--	--	622	0	0.808600	--
1N5144	--	COMMERCIAL	D07	Si	PLASTIC	GB	40A	0.25000	--	--	--	7718	2	10.033400	0.19933
1N5144A	383	AV/BRD-7	D07	Si	JANTX	NSB	25A	--	--	--	--	56	0	0.177790	--
1N5147A	--	COMMERCIAL	D07	Si	PLASTIC	GB	40A	0.25000	--	--	--	18275	7	23.757500	0.29464
1N5148	--	COMMERCIAL	D07	Si	PLASTIC	GB	40A	0.25000	--	--	--	11365	0	14.774500	--
1N5148A	--	COMMERCIAL	D07	Si	PLASTIC	GB	40A	0.25000	--	--	--	17360	9	22.568000	0.39879
1N5456A	--	COMMERCIAL	D07	Si	PLASTIC	GB	40A	--	--	--	--	152	0	0.197600	--
1N5464B	436	AN/BRD-7	D07	Si	JANTX	NSB	25A	--	--	--	--	56	0	0.177790	--
1N5476B	436	AN/BRD-7	D07	Si	JANTX	NSB	25A	--	--	--	--	56	0	0.177790	--
1N5476B	--	AN/ARN-118	--	Si	JTX EQU	AUC	71A	--	--	--	--	2266	0	2.140759	--
1N5476B	--	AN/ARN-118	--	Si	JTX EQU	AUT	71A	--	--	--	--	940	0	1.381611	--
1N5476B	--	AN/ARN-118	--	Si	JTX EQU	AUB	71A	--	--	--	--	376	0	0.568738	--
1N5476B	--	AN/ARN-118	--	Si	JTX EQU	AUA	71A	--	--	--	--	651	0	0.504987	--
1N5476B	--	AN/ARN-118	--	Si	JTX EQU	AUF	71A	--	--	--	--	1451	0	0.849786	--

RAC Discrete Semiconductor Device Database

Diode Section

Test Type : TEST

Device : DIODE, MICROWAVE, GUNN EFFECT

Part Number	Slash Number	Equipment Reference	Package Type	Semi. Material	Quality Level	App Env	Temp Oc	Rated Current (A)	Voltage Stress	Current Stress	Freq. Band	Parts Tested	Number Failed	Part Hours (E06)	Failure Rate (f/10E6 Hrs)
--	--	N/A	--	GaAs	--	---	--	--	--	--	K	--	1	0.274000	3.64964
--	--	N/A	--	GaAs	--	---	--	--	--	--	KY	--	4	1.112000	3.59712
--	--	N/A	--	GaAs	--	---	--	--	--	--	X	--	29	1.809000	16.03096
--	--	N/A	--	GaAs	--	---	--	--	--	--	C	--	0	0.118000	--
--	--	N/A	--	GaAs	--	---	--	--	--	--	X	--	2	0.300000	6.66667
--	--	N/A	--	GaAs	--	---	--	--	--	--	X	--	4	1.114000	3.59066

Test Type : TEST

Device : DIODE, MICROWAVE, IMPATT

Part Number	Slash Number	Equipment Reference	Package Type	Semi. Material	Quality Level	App Env	Temp Oc	Rated Current (A)	Voltage Stress	Current Stress	Freq. Band	Parts Tested	Number Failed	Part Hours (E06)	Failure Rate (f/10E6 Hrs)
--	--	N/A	--	Si	--	---	203J	--	1.000	--	X	10	1	0.031200	32.05128
--	--	N/A	--	Si	--	---	219J	--	0.989	--	X	7	2	0.018710	106.89471
--	--	N/A	--	Si	--	---	232J	--	0.989	--	X	10	2	0.028510	70.15082
--	--	N/A	--	Si	--	---	210J	--	1.000	--	X	42	0	0.163354	--
--	--	N/A	--	Si	--	---	325J	--	1.000	--	X	42	32	0.064000	500.00000
--	--	N/A	--	Si	--	---	218J	--	1.000	--	X	10	0	0.031200	--
--	--	N/A	--	Si	--	---	332J	--	0.989	--	X	40	32	0.015081	2121.87521
--	--	N/A	--	Si	--	---	221J	--	0.989	--	X	45	0	0.142626	--
--	--	N/A	--	GaAs	--	---	215J	0.38500	--	0.904	--	20	3	0.100000	30.00000
--	--	N/A	--	GaAs	--	---	220J	--	--	--	X	40	17	0.040000	425.00000
--	--	N/A	--	GaAs	--	---	235J	--	--	--	--	24	1	0.005760	173.61111

Transistor Section

Test Type : TEST

Device : TRANSISTOR, BIPOLAR, NPN

Part Number	Slash Number	Equipment Reference	Package Type	Semi-Material	Quality Level	App Env	Temp °C	Rated Power (W)	Voltage Stress	Current Stress	Parts Tested	Number Failed	Part Hours (E06)	Failure Rate (f/10E6 Hrs)
2N918	301	N/A	T072	Si	JAN	---	300J	0.20000	--	0.200	84	14	0.099654	140.48608
1VN5201TNF	--	N/A	T03	Si	--	---	200J	12.50000	--	--	17	0	0.042500	--
1VN5201TNF	--	N/A	T03	Si	--	---	200J	12.50000	--	--	17	0	0.042500	--
1VN5201TNF	--	N/A	T03	Si	--	---	200J	12.50000	--	--	17	6	0.042500	141.17647

Test Type : FIELD

Device : TRANSISTOR, BIPOLAR, NPN

Part Number	Slash Number	Equipment Reference	Package Type	Semi-Material	Quality Level	App Env	Temp °C	Rated Power (W)	Voltage Stress	Current Stress	Parts Tested	Number Failed	Part Hours (E06)	Failure Rate (f/10E6 Hrs)
2N1893	182	AN/BRD-7	T03	Si	JANTX	NSB	25A	0.80000	--	--	84	0	0.266685	--
2N2219A	251	F-16 HUD	T03	Si	JANTX	A1F	40A	0.80000	--	--	2032	3	1.105401	2.71395
2N2219A	251	AN/BRD-7	T03	Si	JANTX	NSB	25A	0.80000	--	--	476	0	1.511215	--
2N2219A	251	F-16 FCC	T03	Si	JANTX	A1F	40A	0.80000	--	--	2435	5	1.062800	4.70455
2N2222A	255	AN/ARN-118	T018	Si	JANTX	A1C	55A	0.50000	0.412	0.004	11330	1	10.703795	0.09342
2N2222A	255	AN/ARN-118	T018	Si	JANTX	A1T	55A	0.50000	0.412	0.004	4700	0	13.456990	--
2N2222A	255	AN/ARN-118	T018	Si	JANTX	A1B	55A	0.50000	0.412	0.004	1880	1	2.843690	0.35166
2N2222A	255	AN/ARN-118	T018	Si	JANTX	A1A	55A	0.50000	0.412	0.004	3255	0	2.524935	--
2N2222A	255	AN/ARN-118	T018	Si	JANTX	A1F	55A	0.50000	0.412	0.004	7255	2	4.241585	0.47152
2N2222A	255	AN/ARN-118	T018	Si	JANTX	AUC	71A	0.50000	0.325	0.001	2756	0	2.603626	--
2N2222A	255	AN/ARN-118	T018	Si	JANTX	AUC	71A	0.50000	0.607	0.001	2756	0	2.603626	--
2N2222A	255	AN/ARN-118	T018	Si	JANTX	AUC	71A	0.50000	0.450	0.011	2756	0	2.603626	--
2N2222A	255	AN/ARN-118	T018	Si	JANTX	AUC	71A	0.50000	0.857	0.028	2963	2	2.799454	0.71443
2N2222A	255	AN/ARN-118	T018	Si	JANTX	AUC	71A	0.50000	0.001	0.019	2756	1	2.603626	0.38408
2N2222A	255	AN/ARN-118	T018	Si	JANTX	AUC	71A	0.50000	0.438	--	2756	0	2.603626	--
2N2222A	255	AN/ARN-118	T018	Si	JANTX	AUC	71A	0.50000	0.250	0.004	2756	0	2.603626	--
2N2222A	255	AN/ARN-118	T018	Si	JANTX	AUC	71A	0.50000	0.300	--	2756	1	2.603626	0.38408
2N2222A	255	AN/ARN-118	T018	Si	JANTX	AUC	71A	0.50000	0.563	0.006	5926	0	5.598908	--
2N2222A	255	AN/ARN-118	T018	Si	JANTX	AUC	71A	0.50000	0.004	--	2756	0	2.603626	--
2N2222A	255	AN/ARN-118	T018	Si	JANTX	AUC	71A	0.50000	0.300	0.015	2963	40	2.799454	14.28850
2N2222A	255	AN/ARN-118	T018	Si	JANTX	AUC	71A	0.50000	0.125	0.016	5926	0	5.598908	--

Transistor Section

Test Type : FIELD

Device : TRANSISTOR, BIPOLAR, NPN (CONTINUED FROM PREVIOUS PAGE)

Part Number	Slash Number	Equipment Reference	Package Type	Semimaterial	Quality Level	App Env	Temp °C	Rated Power (W)	Voltage Stress	Current Stress	Parts Tested	Number Failed	Part Hours (E06)	Failure Rate (f/10E6 Hrs)
2N2222A	255	AN/ARN-118	T018	Si	JANTX	AUC	71A	0.50000	0.305	0.012	16536	3	15.621797	0.19204
2N2222A	255	AN/ARN-118	T018	Si	JANTX	AUC	71A	0.50000	0.003	0.019	2756	0	2.603626	--
2N2222A	255	AN/ARN-118	T018	Si	JANTX	AUC	71A	0.50000	0.400	0.019	2963	0	2.799454	--
2N2222A	255	AN/ARN-118	T018	Si	JANTX	AUC	71A	0.50000	0.600	0.005	11852	0	11.197816	--
2N2222A	255	AN/ARN-118	T018	Si	JANTX	AUC	71A	0.50000	0.375	0.012	2756	0	2.603626	--
2N2222A	255	AN/ARN-118	T018	Si	JANTX	AUC	71A	0.50000	0.125	0.016	5926	0	5.598908	--
2N2222A	255	AN/ARN-118	T018	Si	JANTX	AUC	71A	0.50000	0.375	0.012	2756	0	2.603626	--
2N2222A	255	AN/ARN-118	T018	Si	JANTX	AUC	71A	0.50000	0.300	--	2756	0	2.603626	--
2N2222A	255	AN/ARN-118	T018	Si	JANTX	AUC	71A	0.50000	0.175	0.012	2756	0	2.603626	--
2N2222A	255	AN/ARN-118	T018	Si	JANTX	AUC	71A	0.50000	0.300	0.005	2756	0	2.603626	--
2N2222A	255	AN/ARN-118	T018	Si	JANTX	AUC	71A	0.50000	0.300	0.002	2756	0	2.603626	--
2N2222A	255	AN/ARN-118	T018	Si	JANTX	AUC	71A	0.50000	0.300	0.004	2756	0	2.603626	--
2N2222A	255	AN/ARN-118	T018	Si	JANTX	AUC	71A	0.50000	0.600	0.001	2756	0	2.603626	--
2N2222A	255	AN/ARN-118	T018	Si	JANTX	AUC	71A	0.50000	0.129	0.002	5512	1	5.207252	0.19204
2N2222A	255	AN/ARN-118	T018	Si	JANTX	AUC	71A	0.50000	0.350	0.012	2756	0	2.603626	--
2N2222A	255	AN/ARN-118	T018	Si	JANTX	AUC	71A	0.50000	0.250	--	2756	0	2.603626	--
2N2222A	255	AN/ARN-118	T018	Si	JANTX	AUC	71A	0.50000	0.250	--	2756	0	2.603626	--
2N2222A	255	AN/ARN-118	T018	Si	JANTX	AUC	71A	0.50000	0.300	--	2756	0	2.603626	--
2N2222A	255	AN/ARN-118	T018	Si	JANTX	AUC	71A	0.50000	0.300	--	2756	0	2.603626	--
2N2222A	255	AN/ARN-118	T018	Si	JANTX	AUC	71A	0.50000	0.129	0.001	2756	1	2.603626	0.38408
2N2222A	255	AN/ARN-118	T018	Si	JANTX	AUC	71A	0.50000	0.035	0.005	2756	1	2.603626	0.38408
2N2222A	255	AN/ARN-118	T018	Si	JANTX	AUC	71A	0.50000	0.300	0.001	2756	2	2.603626	0.76816
2N2222A	255	AN/ARN-118	T018	Si	JANTX	AUC	71A	0.50000	0.300	0.001	2756	0	2.603626	--
2N2222A	255	AN/ARN-118	T018	Si	JANTX	AUC	71A	0.50000	0.300	--	2756	0	2.603626	--
2N2222A	255	AN/ARN-118	T018	Si	JANTX	AUC	71A	0.50000	0.129	0.005	2756	0	2.603626	--
2N2222A	255	AN/ARN-118	T018	Si	JANTX	AUC	71A	0.50000	0.500	0.012	2756	1	2.603626	0.38408
2N2222A	255	AN/ARN-118	T018	Si	JANTX	AUC	71A	0.50000	0.605	0.004	2756	0	2.603626	--
2N2222A	255	AN/ARN-118	T018	Si	JANTX	AUT	71A	0.50000	0.857	0.028	1229	0	1.806722	--
2N2222A	255	AN/ARN-118	T018	Si	JANTX	AUT	71A	0.50000	0.600	0.005	4917	0	7.226888	--
2N2222A	255	AN/ARN-118	T018	Si	JANTX	AUT	71A	0.50000	0.003	0.019	1143	0	1.680338	--
2N2222A	255	AN/ARN-118	T018	Si	JANTX	AUT	71A	0.50000	0.125	0.016	2458	0	3.613445	--
2N2222A	255	AN/ARN-118	T018	Si	JANTX	AUT	71A	0.50000	0.001	0.019	1143	0	1.680338	--
2N2222A	255	AN/ARN-118	T018	Si	JANTX	AUT	71A	0.50000	0.563	0.006	2458	0	3.613444	--
2N2222A	255	AN/ARN-118	T018	Si	JANTX	AUT	71A	0.50000	0.300	--	1143	1	1.680338	0.59512

Transistor Section

Test Type : FIELD

Device : TRANSISTOR, BIPOLAR, NPN (CONTINUED FROM PREVIOUS PAGE)

Part Number	Slash Number	Equipment Reference	Package Type	Semi. Material	Quality Level	App Env	Temp °C	Rated Power (W)	Voltage Stress	Current Stress	Parts Tested	Number Failed	Part Hours	Failure Rate (f/10E6 Hrs)
2N2222A	255	AN/ARN-118	TO18	Si	JANTX	AUT	71A	0.50000	0.400	0.019	1229	1	1.806722	0.55349
2N2222A	255	AN/ARN-118	TO18	Si	JANTX	AUT	71A	0.50000	0.375	0.012	1143	0	1.680338	--
2N2222A	255	AN/ARN-118	TO18	Si	JANTX	AUT	71A	0.50000	0.300	0.001	1143	0	1.680338	--
2N2222A	255	AN/ARN-118	TO18	Si	JANTX	AUT	71A	0.50000	0.004	--	1143	0	1.680338	--
2N2222A	255	AN/ARN-118	TO18	Si	JANTX	AUT	71A	0.50000	0.375	0.012	1143	0	1.680338	--
2N2222A	255	AN/ARN-118	TO18	Si	JANTX	AUT	71A	0.50000	0.500	0.012	1143	0	1.680338	--
2N2222A	255	AN/ARN-118	TO18	Si	JANTX	AUT	71A	0.50000	0.125	0.016	2458	0	3.613444	--
2N2222A	255	AN/ARN-118	TO18	Si	JANTX	AUT	71A	0.50000	0.305	0.012	6859	1	10.082026	0.09919
2N2222A	255	AN/ARN-118	TO18	Si	JANTX	AUT	71A	0.50000	0.250	--	1143	0	1.680338	--
2N2222A	255	AN/ARN-118	TO18	Si	JANTX	AUT	71A	0.50000	0.438	--	1143	0	1.680338	--
2N2222A	255	AN/ARN-118	TO18	Si	JANTX	AUT	71A	0.50000	0.300	0.015	1229	3	1.806722	1.66047
2N2222A	255	AN/ARN-118	TO18	Si	JANTX	AUT	71A	0.50000	0.300	--	1143	0	1.680338	--
2N2222A	255	AN/ARN-118	TO18	Si	JANTX	AUT	71A	0.50000	0.129	0.005	1143	0	1.680338	--
2N2222A	255	AN/ARN-118	TO18	Si	JANTX	AUT	71A	0.50000	0.129	0.002	2286	0	3.360675	--
2N2222A	255	AN/ARN-118	TO18	Si	JANTX	AUT	71A	0.50000	0.607	0.001	1143	0	1.680338	--
2N2222A	255	AN/ARN-118	TO18	Si	JANTX	AUT	71A	0.50000	0.300	--	1143	0	1.680338	--
2N2222A	255	AN/ARN-118	TO18	Si	JANTX	AUT	71A	0.50000	0.035	0.005	1143	1	1.680338	0.59512
2N2222A	255	AN/ARN-118	TO18	Si	JANTX	AUT	71A	0.50000	0.250	--	1143	0	1.680338	--
2N2222A	255	AN/ARN-118	TO18	Si	JANTX	AUT	71A	0.50000	0.605	0.004	1143	0	1.680338	--
2N2222A	255	AN/ARN-118	TO18	Si	JANTX	AUT	71A	0.50000	0.600	0.001	1143	0	1.680338	--
2N2222A	255	AN/ARN-118	TO18	Si	JANTX	AUT	71A	0.50000	0.250	0.004	1143	0	1.680338	--
2N2222A	255	AN/ARN-118	TO18	Si	JANTX	AUT	71A	0.50000	0.350	0.012	1143	0	1.680338	--
2N2222A	255	AN/ARN-118	TO18	Si	JANTX	AUT	71A	0.50000	0.175	0.012	1143	0	1.680338	--
2N2222A	255	AN/ARN-118	TO18	Si	JANTX	AUT	71A	0.50000	0.450	0.011	1143	0	1.680338	--
2N2222A	255	AN/ARN-118	TO18	Si	JANTX	AUT	71A	0.50000	0.300	--	1143	0	1.680338	--
2N2222A	255	AN/ARN-118	TO18	Si	JANTX	AUT	71A	0.50000	0.300	0.004	1143	0	1.680338	--
2N2222A	255	AN/ARN-118	TO18	Si	JANTX	AUT	71A	0.50000	0.129	0.001	1143	0	1.680338	--
2N2222A	255	AN/ARN-118	TO18	Si	JANTX	AUT	71A	0.50000	0.300	--	1143	0	1.680338	--
2N2222A	255	AN/ARN-118	TO18	Si	JANTX	AUT	71A	0.50000	0.300	0.002	1143	0	1.680338	--
2N2222A	255	AN/ARN-118	TO18	Si	JANTX	AUT	71A	0.50000	0.300	0.005	1143	1	1.680338	0.59512
2N2222A	255	AN/ARN-118	TO18	Si	JANTX	AUT	71A	0.50000	0.325	0.001	1143	0	1.680338	--

Transistor Section

Test Type : FIELD

Device : TRANSISTOR, BIPOLAR, NPN (CONTINUED FROM PREVIOUS PAGE)

Part Number	Slash Number	Equipment Reference	Package Type	Semi-Material	Quality Level	App Env	Temp Oc	Rated Power (W)	Voltage		Current		Parts Tested	Number Failed	Part Hours	Failure Rate (f/10E6 Hrs)
									Stress	Stress	Stress	Stress				
2N2222A	255	AN/ARN-118	T018	Si	JANTX	AUB	71A	0.50000	0.125	0.016	0.016	0.016	983	0	1.487468	--
2N2222A	255	AN/ARN-118	T018	Si	JANTX	AUB	71A	0.50000	0.375	0.012	0.012	0.012	457	0	0.691708	--
2N2222A	255	AN/ARN-118	T018	Si	JANTX	AUB	71A	0.50000	0.400	0.019	0.019	0.019	492	0	0.743734	--
2N2222A	255	AN/ARN-118	T018	Si	JANTX	AUB	71A	0.50000	0.300	0.015	0.015	0.015	492	1	0.743734	1.34457
2N2222A	255	AN/ARN-118	T018	Si	JANTX	AUB	71A	0.50000	0.607	0.001	0.001	0.001	457	0	0.691708	--
2N2222A	255	AN/ARN-118	T018	Si	JANTX	AUB	71A	0.50000	0.600	0.005	0.005	0.005	1967	0	2.974937	--
2N2222A	255	AN/ARN-118	T018	Si	JANTX	AUB	71A	0.50000	0.300	0.001	0.001	0.001	457	0	0.691708	--
2N2222A	255	AN/ARN-118	T018	Si	JANTX	AUB	71A	0.50000	0.125	0.016	0.016	0.016	983	0	1.487686	--
2N2222A	255	AN/ARN-118	T018	Si	JANTX	AUB	71A	0.50000	0.375	0.012	0.012	0.012	457	0	0.691708	--
2N2222A	255	AN/ARN-118	T018	Si	JANTX	AUB	71A	0.50000	0.003	0.019	0.019	0.019	457	1	0.691708	1.44570
2N2222A	255	AN/ARN-118	T018	Si	JANTX	AUB	71A	0.50000	0.438	--	--	--	457	0	0.691708	--
2N2222A	255	AN/ARN-118	T018	Si	JANTX	AUB	71A	0.50000	0.857	0.028	0.028	0.028	492	0	0.743734	--
2N2222A	255	AN/ARN-118	T018	Si	JANTX	AUB	71A	0.50000	0.004	--	--	--	457	0	0.691708	--
2N2222A	255	AN/ARN-118	T018	Si	JANTX	AUB	71A	0.50000	0.001	0.019	0.019	0.019	457	0	0.691708	--
2N2222A	255	AN/ARN-118	T018	Si	JANTX	AUB	71A	0.50000	0.300	--	--	--	457	0	0.691708	--
2N2222A	255	AN/ARN-118	T018	Si	JANTX	AUB	71A	0.50000	0.500	0.012	0.012	0.012	457	0	0.691708	--
2N2222A	255	AN/ARN-118	T018	Si	JANTX	AUB	71A	0.50000	0.250	--	--	--	457	0	0.691708	--
2N2222A	255	AN/ARN-118	T018	Si	JANTX	AUB	71A	0.50000	0.563	0.006	0.006	0.006	983	0	1.487469	--
2N2222A	255	AN/ARN-118	T018	Si	JANTX	AUB	71A	0.50000	0.305	0.012	0.012	0.012	2744	0	4.150250	--
2N2222A	255	AN/ARN-118	T018	Si	JANTX	AUB	71A	0.50000	0.129	0.001	0.001	0.001	457	0	0.691708	--
2N2222A	255	AN/ARN-118	T018	Si	JANTX	AUB	71A	0.50000	0.300	--	--	--	457	0	0.691708	--
2N2222A	255	AN/ARN-118	T018	Si	JANTX	AUB	71A	0.50000	0.350	0.012	0.012	0.012	457	0	0.691708	--
2N2222A	255	AN/ARN-118	T018	Si	JANTX	AUB	71A	0.50000	0.300	0.004	0.004	0.004	457	0	0.691708	--
2N2222A	255	AN/ARN-118	T018	Si	JANTX	AUB	71A	0.50000	0.300	0.005	0.005	0.005	457	0	0.691708	--
2N2222A	255	AN/ARN-118	T018	Si	JANTX	AUB	71A	0.50000	0.129	0.005	0.005	0.005	457	1	0.691708	1.44570
2N2222A	255	AN/ARN-118	T018	Si	JANTX	AUB	71A	0.50000	0.300	--	--	--	457	0	0.691708	--
2N2222A	255	AN/ARN-118	T018	Si	JANTX	AUB	71A	0.50000	0.605	0.004	0.004	0.004	457	0	0.691708	--
2N2222A	255	AN/ARN-118	T018	Si	JANTX	AUB	71A	0.50000	0.450	0.011	0.011	0.011	457	0	0.691708	--
2N2222A	255	AN/ARN-118	T018	Si	JANTX	AUB	71A	0.50000	0.325	0.001	0.001	0.001	457	0	0.691708	--
2N2222A	255	AN/ARN-118	T018	Si	JANTX	AUB	71A	0.50000	0.250	0.004	0.004	0.004	457	0	0.691708	--
2N2222A	255	AN/ARN-118	T018	Si	JANTX	AUB	71A	0.50000	0.175	0.012	0.012	0.012	457	0	0.691708	--
2N2222A	255	AN/ARN-118	T018	Si	JANTX	AUB	71A	0.50000	0.300	0.002	0.002	0.002	457	0	0.691708	--
2N2222A	255	AN/ARN-118	T018	Si	JANTX	AUB	71A	0.50000	0.129	0.002	0.002	0.002	915	0	1.383417	--

Transistor Section

Test Type : FIELD

Device : TRANSISTOR, BIPOLAR, NPN (CONTINUED FROM PREVIOUS PAGE)

Part Number	Slash Number	Equipment Reference	Package Type	Semi. Material	Quality Level	App Env	Temp °C	Rated Power (W)	Voltage Stress	Current Stress	Parts Tested	Number Failed	Part Hours (E06)	Failure Rate (f/10E6 Hrs)
2N2222A	255	AN/ARN-118	T018	Si	JANTX	AUB	71A	0.50000	0.250	--	457	0	0.691708	--
2N2222A	255	AN/ARN-118	T018	Si	JANTX	AUB	71A	0.50000	0.300	--	457	0	0.691708	--
2N2222A	255	AN/ARN-118	T018	Si	JANTX	AUB	71A	0.50000	0.035	0.005	457	4	0.691708	5.78279
2N2222A	255	AN/ARN-118	T018	Si	JANTX	AUB	71A	0.50000	0.300	--	457	0	0.691708	--
2N2222A	255	AN/ARN-118	T018	Si	JANTX	AUB	71A	0.50000	0.600	0.001	457	0	0.691708	--
2N2222A	255	AN/ARN-118	T018	Si	JANTX	AUA	71A	0.50000	0.125	0.016	1703	0	1.320735	--
2N2222A	255	AN/ARN-118	T018	Si	JANTX	AUA	71A	0.50000	0.563	0.006	1703	0	1.320735	--
2N2222A	255	AN/ARN-118	T018	Si	JANTX	AUA	71A	0.50000	0.001	0.019	792	0	0.614173	--
2N2222A	255	AN/ARN-118	T018	Si	JANTX	AUA	71A	0.50000	0.004	--	792	0	0.614173	--
2N2222A	255	AN/ARN-118	T018	Si	JANTX	AUA	71A	0.50000	0.003	0.019	792	0	0.614173	--
2N2222A	255	AN/ARN-118	T018	Si	JANTX	AUA	71A	0.50000	0.375	0.012	792	1	0.614173	1.62821
2N2222A	255	AN/ARN-118	T018	Si	JANTX	AUA	71A	0.50000	0.600	0.005	3405	0	2.641470	--
2N2222A	255	AN/ARN-118	T018	Si	JANTX	AUA	71A	0.50000	0.400	0.019	851	0	0.660367	--
2N2222A	255	AN/ARN-118	T018	Si	JANTX	AUA	71A	0.50000	0.300	0.015	851	2	0.660368	3.02861
2N2222A	255	AN/ARN-118	T018	Si	JANTX	AUA	71A	0.50000	0.300	--	792	0	0.614173	--
2N2222A	255	AN/ARN-118	T018	Si	JANTX	AUA	71A	0.50000	0.125	0.016	1703	0	1.320735	--
2N2222A	255	AN/ARN-118	T018	Si	JANTX	AUA	71A	0.50000	0.305	0.012	4750	1	3.685040	0.27137
2N2222A	255	AN/ARN-118	T018	Si	JANTX	AUA	71A	0.50000	0.375	0.012	792	0	0.614173	--
2N2222A	255	AN/ARN-118	T018	Si	JANTX	AUA	71A	0.50000	0.300	0.001	792	0	0.614173	--
2N2222A	255	AN/ARN-118	T018	Si	JANTX	AUA	71A	0.50000	0.250	--	792	0	0.614173	--
2N2222A	255	AN/ARN-118	T018	Si	JANTX	AUA	71A	0.50000	0.607	0.001	792	0	0.614173	--
2N2222A	255	AN/ARN-118	T018	Si	JANTX	AUA	71A	0.50000	0.857	0.028	351	1	0.660368	1.51431
2N2222A	255	AN/ARN-118	T018	Si	JANTX	AUA	71A	0.50000	0.438	--	792	0	0.614173	--
2N2222A	255	AN/ARN-118	T018	Si	JANTX	AUA	71A	0.50000	0.350	0.012	792	0	0.614173	--
2N2222A	255	AN/ARN-118	T018	Si	JANTX	AUA	71A	0.50000	0.250	0.004	792	0	0.614173	--
2N2222A	255	AN/ARN-118	T018	Si	JANTX	AUA	71A	0.50000	0.300	--	792	0	0.614173	--
2N2222A	255	AN/ARN-118	T018	Si	JANTX	AUA	71A	0.50000	0.605	0.004	792	0	0.614173	--
2N2222A	255	AN/ARN-118	T018	Si	JANTX	AUA	71A	0.50000	0.250	--	792	0	0.614173	--
2N2222A	255	AN/ARN-118	T018	Si	JANTX	AUA	71A	0.50000	0.300	--	792	0	0.614173	--
2N2222A	255	AN/ARN-118	T018	Si	JANTX	AUA	71A	0.50000	0.300	--	792	0	0.614173	--
2N2222A	255	AN/ARN-118	T018	Si	JANTX	AUA	71A	0.50000	0.300	--	792	0	0.614173	--
2N2222A	255	AN/ARN-118	T018	Si	JANTX	AUA	71A	0.50000	0.129	0.001	792	0	0.614173	--

Transistor Section

Test Type : FIELD

Device : TRANSISTOR, BIPOLAR, NPN (CONTINUED FROM PREVIOUS PAGE)

Part Number	Slash Number	Equipment Reference	Package Type	Semi. Material	Quality Level	App Env	Temp °C	Rated Power (W)	Voltage Stress	Current Stress	Parts Tested	Number Failed	Part Hours	Failure Rate (f/10E6 Hrs)
2N2222A	255	AN/ARN-118	T018	Si	JANTX	AUA	71A	0.50000	0.450	0.011	792	0	0.614173	--
2N2222A	255	AN/ARN-118	T018	Si	JANTX	AUA	71A	0.50000	0.300	--	792	0	0.614173	--
2N2222A	255	AN/ARN-118	T018	Si	JANTX	AUA	71A	0.50000	0.129	0.005	792	0	0.614173	--
2N2222A	255	AN/ARN-118	T018	Si	JANTX	AUA	71A	0.50000	0.300	0.004	792	0	0.614173	--
2N2222A	255	AN/ARN-118	T018	Si	JANTX	AUA	71A	0.50000	0.175	0.012	792	0	0.614173	--
2N2222A	255	AN/ARN-118	T018	Si	JANTX	AUA	71A	0.50000	0.129	0.002	1584	0	1.228347	--
2N2222A	255	AN/ARN-118	T018	Si	JANTX	AUA	71A	0.50000	0.300	0.002	792	0	0.614173	--
2N2222A	255	AN/ARN-118	T018	Si	JANTX	AUA	71A	0.50000	0.035	0.005	792	0	0.614173	--
2N2222A	255	AN/ARN-118	T018	Si	JANTX	AUA	71A	0.50000	0.325	0.001	792	0	0.614173	--
2N2222A	255	AN/ARN-118	T018	Si	JANTX	AUA	71A	0.50000	0.500	0.012	792	0	0.614173	--
2N2222A	255	AN/ARN-118	T018	Si	JANTX	AUA	71A	0.50000	0.600	0.001	792	1	0.614173	1.62821
2N2222A	255	AN/ARN-118	T018	Si	JANTX	AUA	71A	0.50000	0.300	0.005	792	0	0.614173	--
2N2222A	255	AN/ARN-118	T018	Si	JANTX	AUF	71A	0.50000	0.500	0.012	1765	0	1.033523	--
2N2222A	255	AN/ARN-118	T018	Si	JANTX	AUF	71A	0.50000	0.300	0.015	1897	1	1.108953	0.90175
2N2222A	255	AN/ARN-118	T018	Si	JANTX	AUF	71A	0.50000	0.125	0.016	3795	1	2.217906	0.45088
2N2222A	255	AN/ARN-118	T018	Si	JANTX	AUF	71A	0.50000	0.305	0.012	10588	1	6.201141	0.16126
2N2222A	255	AN/ARN-118	T018	Si	JANTX	AUF	71A	0.50000	0.125	0.016	3795	1	2.217906	0.45088
2N2222A	255	AN/ARN-118	T018	Si	JANTX	AUF	71A	0.50000	0.250	0.004	1765	0	1.033523	--
2N2222A	255	AN/ARN-118	T018	Si	JANTX	AUF	71A	0.50000	0.001	0.019	1765	0	1.033523	--
2N2222A	255	AN/ARN-118	T018	Si	JANTX	AUF	71A	0.50000	0.300	--	1765	0	1.033523	--
2N2222A	255	AN/ARN-118	T018	Si	JANTX	AUF	71A	0.50000	0.438	--	1765	0	1.033523	--
2N2222A	255	AN/ARN-118	T018	Si	JANTX	AUF	71A	0.50000	0.003	0.019	1765	0	1.033523	--
2N2222A	255	AN/ARN-118	T018	Si	JANTX	AUF	71A	0.50000	0.375	0.012	1765	1	1.033523	0.96756
2N2222A	255	AN/ARN-118	T018	Si	JANTX	AUF	71A	0.50000	0.400	0.019	1897	1	1.108953	0.90175
2N2222A	255	AN/ARN-118	T018	Si	JANTX	AUF	71A	0.50000	0.375	0.012	1765	0	1.033523	--
2N2222A	255	AN/ARN-118	T018	Si	JANTX	AUF	71A	0.50000	0.450	0.011	1765	0	1.033523	--
2N2222A	255	AN/ARN-118	T018	Si	JANTX	AUF	71A	0.50000	0.004	--	1765	0	1.033523	--
2N2222A	255	AN/ARN-118	T018	Si	JANTX	AUF	71A	0.50000	0.350	0.012	1765	0	1.033523	--
2N2222A	255	AN/ARN-118	T018	Si	JANTX	AUF	71A	0.50000	0.300	0.002	1765	1	1.033523	0.96756
2N2222A	255	AN/ARN-118	T018	Si	JANTX	AUF	71A	0.50000	0.300	--	1765	0	1.033523	--
2N2222A	255	AN/ARN-118	T018	Si	JANTX	AUF	71A	0.50000	0.300	--	1765	0	1.033523	--
2N2222A	255	AN/ARN-118	T018	Si	JANTX	AUF	71A	0.50000	0.605	0.004	1765	0	1.033523	--
2N2222A	255	AN/ARN-118	T018	Si	JANTX	AUF	71A	0.50000	0.250	--	1765	1	1.033523	0.96756

Transistor Section

Test Type : FIELD

Device : TRANSISTOR, BIPOLAR, NPN (CONTINUED FROM PREVIOUS PAGE)

Part Number	Slash Number	Equipment Reference	Package Type	Semi. Material	Quality Level	App Env	Temp °C	Rated Power (W)	Voltage Stress	Current Stress	Parts Tested	Number Failed	Part Hours (E06)	Failure Rate (f/10E6 Hrs)
2N2222A	255	AN/ARN-118	T018	Si	JANTX	AUF	71A	0.50000	0.129	0.001	1765	0	1.033523	--
2N2222A	255	AN/ARN-118	T018	Si	JANTX	AUF	71A	0.50000	0.250	--	1765	0	1.033523	--
2N2222A	255	AN/ARN-118	T018	Si	JANTX	AUF	71A	0.50000	0.300	0.004	1765	0	1.033523	--
2N2222A	255	AN/ARN-118	T018	Si	JANTX	AUF	71A	0.50000	0.300	--	1765	0	1.033523	--
2N2222A	255	AN/ARN-118	T018	Si	JANTX	AUF	71A	0.50000	0.035	0.005	1765	3	1.033523	2.90269
2N2222A	255	AN/ARN-118	T018	Si	JANTX	AUF	71A	0.50000	0.175	0.012	1765	0	1.033523	--
2N2222A	255	AN/ARN-118	T018	Si	JANTX	AUF	71A	0.50000	0.300	0.005	1765	0	1.033523	--
2N2222A	255	AN/ARN-118	T018	Si	JANTX	AUF	71A	0.50000	0.300	--	1765	0	1.033523	--
2N2222A	255	AN/ARN-118	T018	Si	JANTX	AUF	71A	0.50000	0.129	0.002	3529	0	2.067047	--
2N2222A	255	AN/ARN-118	T018	Si	JANTX	AUF	71A	0.50000	0.600	0.001	1765	0	1.033523	--
2N2222A	255	AN/ARN-118	T018	Si	JANTX	AUF	71A	0.50000	0.325	0.001	1765	0	1.033523	--
2N2222A	255	AN/ARN-118	T018	Si	JANTX	AUF	71A	0.50000	0.607	0.001	1765	0	1.033523	--
2N2222A	255	AN/ARN-118	T018	Si	JANTX	AUF	71A	0.50000	0.300	0.001	1765	0	1.033523	--
2N2222A	255	F-16 HUD	T018	Si	JANTX	AIF	40A	0.50000	--	--	4572	7	2.487079	2.81455
2N2222A	255	AN/BRD-7	T018	Si	JANTX	NSB	25A	0.50000	--	--	4116	3	13.067565	0.22958
2N2222A	255	F-16 FCC	T018	Si	JANTX	AIF	40A	0.50000	--	--	39934	55	17.431300	3.15524
2N2369	317	AN/ARN-118	T018	Si	JANTX	AUC	71A	0.36000	0.633	0.015	2266	1	2.140759	0.46712
2N2369	317	AN/ARN-118	T018	Si	JANTX	AUT	71A	0.36000	0.633	0.015	940	4	1.381611	2.89517
2N2369	317	AN/ARN-118	T018	Si	JANTX	AUB	71A	0.36000	0.633	0.015	376	1	0.568738	1.75828
2N2369	317	AN/ARN-118	T018	Si	JANTX	AUA	71A	0.36000	0.633	0.015	651	1	0.504987	1.98025
2N2369	317	AN/ARN-118	T018	Si	JANTX	AUF	71A	0.36000	0.633	0.015	1451	0	0.849785	--
2N2405	--	AN/ARN-118	T05	Si	JTX EQU	AUC	71A	1.00000	0.115	0.006	18128	2	17.126072	0.11678
2N2405	--	AN/ARN-118	T05	Si	JTX EQU	AUT	71A	1.00000	0.115	0.006	7520	2	11.052888	0.18095
2N2405	--	AN/ARN-118	T05	Si	JTX EQU	AUB	71A	1.00000	0.115	0.006	3008	2	4.549904	0.43957
2N2405	--	AN/ARN-118	T05	Si	JTX EQU	AUA	71A	1.00000	0.115	0.006	5208	1	4.039896	0.24753
2N2405	--	AN/ARN-118	T05	Si	JTX EQU	AUF	71A	1.00000	0.115	0.006	11608	1	6.798288	0.14710
2N2432	313	AN/ARN-118	T018	Si	JANTX	AUC	71A	0.30000	0.327	0.144	11330	3	10.703795	0.28027
2N2432	313	AN/ARN-118	T018	Si	JANTX	AUC	71A	0.30000	0.327	0.164	4532	0	4.281518	--
2N2432	313	AN/ARN-118	T018	Si	JANTX	AUT	71A	0.30000	0.327	0.144	4700	1	6.908055	0.14476
2N2432	313	AN/ARN-118	T018	Si	JANTX	AUT	71A	0.30000	0.327	0.164	1880	0	2.763222	--
2N2432	313	AN/ARN-118	T018	Si	JANTX	AUB	71A	0.30000	0.327	0.164	752	0	1.137476	--

Transistor Section

Test Type : FIELD

Device : TRANSISTOR, BIPOLAR, NPN (CONTINUED FROM PREVIOUS PAGE)

Part Number	Slash Number	Equipment Reference	Package Type	Semi. Material	Quality Level	App Env	Temp °C	Rated Power (W)	Voltage Stress	Current Stress	Parts Tested	Number Failed	Part Hours (E06)	Failure Rate (f/10E6 Hrs)
2N2432	313	AN/ARN-118	T018	Si	JANTX	AUB	71A	0.30000	0.327	0.144	1880	0	2.843690	--
2N2432	313	AN/ARN-118	T018	Si	JANTX	AUA	71A	0.30000	0.327	0.144	3255	0	2.524935	--
2N2432	313	AN/ARN-118	T018	Si	JANTX	AUA	71A	0.30000	0.327	0.164	1302	0	1.009974	--
2N2432	313	AN/ARN-118	T018	Si	JANTX	AUF	71A	0.30000	0.327	0.144	7255	0	4.240115	--
2N2432	313	AN/ARN-118	T018	Si	JANTX	AUF	71A	0.30000	0.327	0.164	2902	0	1.699572	--
2N2857	343	AN/BRD-7	T072	Si	JANTX	NSB	25A	0.30000	--	--	1036	0	3.289115	--
2N3011	--	AN/ARN-118	T018	Si	JTX EQU	AUC	71A	0.36000	0.417	0.050	11330	4	10.703795	0.37370
2N3011	--	AN/ARN-118	T018	Si	JTX EQU	AUT	71A	0.36000	0.417	0.050	4700	3	6.908055	0.43428
2N3011	--	AN/ARN-118	T018	Si	JTX EQU	AUB	71A	0.36000	0.417	0.050	1880	1	2.843690	0.35166
2N3011	--	AN/ARN-118	T018	Si	JTX EQU	AUA	71A	0.36000	0.417	0.050	3255	2	2.524935	0.79210
2N3011	--	AN/ARN-118	T018	Si	JTX EQU	AUF	71A	0.36000	0.417	0.050	7255	2	4.248930	0.47071
2N3019	391	AN/ARN-118	T05	Si	JANTX	AUC	71A	0.80000	0.079	0.192	2266	39	2.140759	18.21784
2N3019	391	AN/ARN-118	T05	Si	JANTX	AUT	71A	0.80000	0.079	0.192	940	6	1.381611	4.34276
2N3019	391	AN/ARN-118	T05	Si	JANTX	AUB	71A	0.80000	0.079	0.192	376	1	0.568738	1.75828
2N3019	391	AN/ARN-118	T05	Si	JANTX	AUA	71A	0.80000	0.079	0.192	651	4	0.504987	7.92100
2N3019	391	AN/ARN-118	T05	Si	JANTX	AUF	71A	0.80000	0.150	0.010	1451	8	0.848023	9.43371
2N3019	391	F-16 HUD	T05	Si	JANTX	AIF	40A	0.80000	--	--	1016	0	0.552697	--
2N3019	391	AN/BRD-7	T05	Si	JANTX	NSB	25A	0.80000	--	--	196	0	0.622265	--
2N3019	391	F-16 FCC	T05	Si	JANTX	AIF	40A	0.80000	--	--	487	0	0.212575	--
2N3020	--	AN/BRD-7	T039	Si	JTX EQU	NSB	25A	0.50000	--	--	84	0	0.266685	--
2N3054	--	AN/ARN-118	F4E	Si	JTX EQU	AIC	55A	25.00000	0.208	0.038	2266	0	2.140759	--
2N3054	--	AN/ARN-118	F4E	Si	JTX EQU	AIT	55A	25.00000	0.208	0.038	940	0	2.691398	--
2N3054	--	AN/ARN-118	F4E	Si	JTX EQU	AIB	55A	25.00000	0.208	0.038	376	0	0.568738	--
2N3054	--	AN/ARN-118	F4E	Si	JTX EQU	AIA	55A	25.00000	0.208	0.038	651	0	0.504987	--
2N3054	--	AN/ARN-118	F4E	Si	JTX EQU	AIF	55A	25.00000	0.208	0.038	1451	0	0.848317	--
2N3054	--	AN/ARN-118	F4E	Si	JTX EQU	AUC	71A	25.00000	0.208	0.038	9064	3	8.563036	0.35034
2N3054	--	AN/ARN-118	F4E	Si	JTX EQU	AUT	71A	25.00000	0.208	0.038	3760	2	5.526444	0.36190
2N3054	--	AN/ARN-118	F4E	Si	JTX EQU	AUB	71A	25.00000	0.208	0.038	1504	0	2.274952	--
2N3054	--	AN/ARN-118	F4E	Si	JTX EQU	AUA	71A	25.00000	0.208	0.038	2604	0	2.019948	--
2N3054	--	AN/ARN-118	F4E	Si	JTX EQU	AUF	71A	25.00000	0.208	0.038	5804	1	3.399144	0.29419
2N3057A	391	AN/BRD-7	T046	Si	JANTX	NSB	25A	0.40000	--	--	504	0	1.600110	--
2N3421	393	F-16 HUD	T05	Si	JANTX	AIF	40A	1.00000	--	--	1016	0	0.552697	--
2N3429	--	F-16 HUD	T248	Si	JTX EQU	AIF	40A	150.00000	--	--	508	0	0.276358	--

Transistor Section

Test Type : FIELD

Device : TRANSISTOR, BIPOLAR, NPN (CONTINUED FROM PREVIOUS PAGE)

Part Number	Slash Number	Equipment Reference	Package Type	Semi. Material	Quality Level	App Env	Temp °C	Rated Power (W)	Voltage Stress	Current Stress	Parts Tested	Number Failed	Part Hours	Failure Rate (f/10E6 Hrs)
2N3442	370	AN/BRD-7	T03	Si	JAN	NSB	25A	117.00000	--	--	168	0	0.533370	--
2N3499	366	AN/BRD-7	T039	Si	JANTX	NSB	25A	1.00000	--	--	56	0	0.177790	--
2N3501	366	F-16 HUD	T05	Si	JANTX	ATF	40A	1.00000	--	--	2032	4	1.105394	3.61862
2N3584	384	AN/ARN-118	T066	Si	JANTX	AUC	71A	2.50000	--	--	2266	1	2.140759	0.46712
2N3584	384	AN/ARN-118	T066	Si	JANTX	AUT	71A	2.50000	--	--	940	1	1.381611	0.72379
2N3584	384	AN/ARN-118	T066	Si	JANTX	AUB	71A	2.50000	--	--	376	0	0.568738	--
2N3584	384	AN/ARN-118	T066	Si	JANTX	AUA	71A	2.50000	--	--	651	0	0.504987	--
2N3584	384	AN/ARN-118	T066	Si	JANTX	AUF	71A	2.50000	--	--	1451	0	0.849786	--
2N3584	384	F-16 HUD	T066	Si	JANTX	ATF	40A	2.50000	--	--	508	2	0.276358	7.23699
2N3700	391	AN/ARN-118	T018	Si	JANTX	AUC	71A	0.50000	0.284	0.008	29458	1	27.829867	0.03593
2N3700	391	AN/ARN-118	T018	Si	JANTX	AUT	71A	0.50000	0.284	0.008	12220	1	17.960943	0.05568
2N3700	391	AN/ARN-118	T018	Si	JANTX	AUB	71A	0.50000	0.284	0.008	4888	1	7.393594	0.13525
2N3700	391	AN/ARN-118	T018	Si	JANTX	AUA	71A	0.50000	0.284	0.008	8463	3	6.564831	0.45698
2N3700	391	AN/ARN-118	T018	Si	JANTX	AUF	71A	0.50000	0.284	0.008	18863	2	11.047218	0.18104
2N3767	518	AN/ARN-118	T066	Si	JANTX	AUC	71A	25.00000	--	--	2266	0	2.140759	--
2N3767	518	AN/ARN-118	T066	Si	JANTX	AUT	71A	25.00000	--	--	940	0	1.381611	--
2N3767	518	AN/ARN-118	T066	Si	JANTX	AUB	71A	25.00000	--	--	376	0	0.568738	--
2N3767	518	AN/ARN-118	T066	Si	JANTX	AUA	71A	25.00000	--	--	651	0	0.504987	--
2N3767	518	AN/ARN-118	T066	Si	JANTX	AUF	71A	25.00000	--	--	1451	0	0.849786	--
2N3960	399	AN/BRD-7	T018	Si	JAN	NSB	25A	0.40000	--	--	56	0	0.177790	--
2N3960	399	AN/BRD-7	T018	Si	JANTX	NSB	25A	0.40000	--	--	728	0	2.311270	--
2N5038	439	AN/ARN-118	T03	Si	JANTX	AUC	71A	140.00000	0.222	0.050	2266	2	2.140759	0.93425
2N5038	439	AN/ARN-118	T03	Si	JANTX	AUT	71A	140.00000	0.222	0.050	940	0	1.381611	--
2N5038	439	AN/ARN-118	T03	Si	JANTX	AUB	71A	140.00000	0.222	0.050	376	1	0.568738	1.75828
2N5038	439	AN/ARN-118	T03	Si	JANTX	AUA	71A	140.00000	0.222	0.050	651	0	0.504987	--
2N5038	439	AN/ARN-118	T03	Si	JANTX	AUF	71A	140.00000	0.222	0.050	1451	1	0.849786	1.17677
2N5179	--	AN/ARN-118	T072	Si	JTX EQU	AUC	71A	0.20000	--	0.240	2266	2	2.140759	0.93425
2N5179	--	AN/ARN-118	T072	Si	JTX EQU	AUT	71A	0.20000	--	0.240	3759	1	5.526444	0.18095
2N5179	--	AN/ARN-118	T072	Si	JTX EQU	AUB	71A	0.20000	--	0.240	1504	1	2.274952	0.43957
2N5179	--	AN/ARN-118	T072	Si	JTX EQU	AUA	71A	0.20000	--	0.240	2604	2	2.019948	0.99012
2N5179	--	AN/ARN-118	T072	Si	JTX EQU	AUF	71A	0.20000	--	0.240	5804	1	3.399144	0.29419

Transistor Section

Test Type : FIELD

Device : TRANSISTOR, BIPOLAR, NPN (CONTINUED FROM PREVIOUS PAGE)

Part Number	Slash Number	Equipment Reference	Package Type	Semi. Material	Quality Level	App Env	Temp °C	Rated Power (W)	Voltage Stress	Current Stress	Parts Tested	Number Failed	Part Hours (E06)	Failure Rate (f/10E6 Hrs)
2N5237	394	F-16 HUD	T05	Si	JANTX	AIF	40A	1.50000	--	--	1016	17	0.552697	30.75826
2N5482	--	AN/ARN-118	T73A	Si	JTX EQU	AUC	71A	10.00000	0.400	0.029	2266	8	2.140759	3.73699
2N5482	--	AN/ARN-118	T73A	Si	JTX EQU	AUT	71A	10.00000	0.400	0.029	940	1	1.381611	0.72379
2N5482	--	AN/ARN-118	T73A	Si	JTX EQU	AUB	71A	10.00000	0.400	0.029	376	1	0.568738	1.75828
2N5482	--	AN/ARN-118	T73A	Si	JTX EQU	AUA	71A	10.00000	0.400	0.029	651	1	0.504987	1.98025
2N5482	--	AN/ARN-118	T73A	Si	JTX EQU	AUF	71A	10.00000	0.400	0.029	1451	1	0.849786	1.17677
2N6340	--	AN/ARN-118	T03	Si	JTX EQU	AUC	71A	200.00000	0.857	0.040	2266	16	2.140759	7.47398
2N6340	--	AN/ARN-118	T03	Si	JTX EQU	AUT	71A	200.00000	0.857	0.040	940	1	1.381611	0.72379
2N6340	--	AN/ARN-118	T03	Si	JTX EQU	AUB	71A	200.00000	0.857	0.040	376	7	0.568738	12.30795
2N6340	--	AN/ARN-118	T03	Si	JTX EQU	AUA	71A	200.00000	0.857	0.040	651	2	0.504987	3.96050
2N6340	--	AN/ARN-118	T03	Si	JTX EQU	AUF	71A	200.00000	0.857	0.040	1451	8	0.849786	9.41413
2N657	074	AN/BRD-7	T039	Si	JAN	NSB	25A	1.00000	--	--	84	1	0.266685	3.74974
2N708	312	AN/BRD-7	T018	Si	JANTX	NSB	25A	0.36000	--	--	420	0	1.333425	--
2N718A	181	AN/BRD-7	T018	Si	JANTX	NSB	25A	0.50000	--	--	1960	0	6.222650	--
2N910	274	AN/BRD-7	T018	Si	JANTX	NSB	25A	0.50000	--	--	448	0	1.422310	--
2N916	271	AN/BRD-7	T018	Si	JAN	NSB	25A	0.36000	--	--	1792	0	5.689280	--
2N916	271	AN/BRD-7	T018	Si	JANTX	NSB	25A	0.36000	--	--	420	0	1.333425	--
2N918	301	AN/BRD-7	T072	Si	JANTX	NSB	25A	0.20000	--	--	5264	1	16.712260	0.05984
66701	--	AN/ARN-118	T066	Si	JTX EQU	AUC	71A	35.00000	--	--	2266	0	2.140759	--
66701	--	AN/ARN-118	T066	Si	JTX EQU	AUT	71A	35.00000	--	--	940	0	1.381611	--
66701	--	AN/ARN-118	T066	Si	JTX EQU	AUB	71A	35.00000	--	--	376	0	0.568738	--
66701	--	AN/ARN-118	T066	Si	JTX EQU	AUA	71A	35.00000	--	--	651	0	0.504987	--
66701	--	AN/ARN-118	T066	Si	JTX EQU	AUF	71A	35.00000	--	--	1451	0	0.849786	--

Test Type : FIELD

Device : TRANSISTOR, BIPOLAR, PNP

Part Number	Slash Number	Equipment Reference	Package Type	Semi. Material	Quality Level	App Env	Temp °C	Rated Power (W)	Voltage Stress	Current Stress	Parts Tested	Number Failed	Part Hours (E06)	Failure Rate (f/10E6 Hrs)
2N04A	--	COMMERCIAL	T05	Ge	PLASTIC	GB	40A	0.15000	--	--	114	0	0.148200	--
2N174	013	COMMERCIAL	T03	Ge	PLASTIC	GB	40A	30.00000	--	--	1068	0	1.388400	--
2N2556	--	COMMERCIAL	T028	Ge	PLASTIC	GB	40A	20.00000	--	--	3010	1	3.913000	0.25556
2N2635	--	COMMERCIAL	T018	Ge	PLASTIC	GB	40A	0.30000	--	--	28440	10	36.972000	0.27047

Transistor Section

Test Type : FIELD

Device : TRANSISTOR, BIPOLAR, PNP (CONTINUED FROM PREVIOUS PAGE)

Part Number	Slash Number	Equipment Reference	Package Type	Semi. Material	Quality Level	App Env	Temp °C	Rated Power (W)	Voltage Stress	Current Stress	Parts Tested	Number Failed	Part Hours (E6)	Failure Rate (f/10E6 Hrs)
2N2904	290	COMMERCIAL	T03	Si	PLASTIC	GB	40A	0.60000	--	--	1614	0	2.098200	--
2N2904A	290	COMMERCIAL	T03	Si	PLASTIC	GB	40A	0.60000	--	--	1054499	355	1370.848700	0.25896
2N2905	290	AN/ARN-118	T05	Si	JANTX	AUC	71A	0.40000	0.525	0.003	9064	0	8.563036	--
2N2905	290	AN/ARN-118	T05	Si	JANTX	AUT	71A	0.40000	0.525	0.003	3760	0	5.526444	--
2N2905	290	AN/ARN-118	T05	Si	JANTX	AUB	71A	0.40000	0.525	0.003	1504	0	2.274952	--
2N2905	290	AN/ARN-118	T05	Si	JANTX	AUA	71A	0.40000	0.525	0.003	2604	0	2.019948	--
2N2905	290	AN/ARN-118	T05	Si	JANTX	AUF	71A	0.40000	0.525	0.003	5804	0	3.399144	--
2N2905A	290	F-16 HUD	T05	Si	JANTX	A1F	40A	0.60000	--	--	508	1	0.276358	3.61849
2N2905A	290	F-16 FCC	T05	Si	JANTX	A1F	40A	0.60000	--	--	2435	4	1.062800	3.76364
2N2905A	290	COMMERCIAL	T05	Si	PLASTIC	GB	40A	0.60000	--	--	284005	77	369.206500	0.20856
2N2907	291	COMMERCIAL	T018	Ge	PLASTIC	GB	40A	0.40000	--	--	38797	0	50.436100	--
2N2907A	291	AN/ARN-118	T018	Si	JANTX	A1C	55A	0.40000	0.245	0.100	4532	1	4.281518	0.23356
2N2907A	291	AN/ARN-118	T018	Si	JANTX	A1T	55A	0.40000	0.245	0.100	1880	0	5.382796	--
2N2907A	291	AN/ARN-118	T018	Si	JANTX	A1B	55A	0.40000	0.245	0.100	752	0	1.137476	--
2N2907A	291	AN/ARN-118	T018	Si	JANTX	A1A	55A	0.40000	0.245	0.100	1302	0	1.009974	--
2N2907A	291	AN/ARN-118	T018	Si	JANTX	A1F	55A	0.40000	0.245	0.100	2902	0	1.696634	--
2N2907A	291	AN/ARN-118	T018	Si	JANTX	AUC	71A	0.40000	0.183	0.017	2455	0	2.319556	--
2N2907A	291	AN/ARN-118	T018	Si	JANTX	AUC	71A	0.40000	0.200	0.017	2455	0	2.319556	--
2N2907A	291	AN/ARN-118	T018	Si	JANTX	AUC	71A	0.40000	0.400	--	4910	0	4.638311	--
2N2907A	291	AN/ARN-118	T018	Si	JANTX	AUC	71A	0.40000	0.233	0.017	2455	0	2.319556	--
2N2907A	291	AN/ARN-118	T018	Si	JANTX	AUC	71A	0.40000	0.245	0.100	20394	2	19.266831	0.10381
2N2907A	291	AN/ARN-118	T018	Si	JANTX	AUC	71A	0.40000	0.200	--	2455	0	2.319156	--
2N2907A	291	AN/ARN-118	T018	Si	JANTX	AUC	71A	0.40000	0.217	0.003	2455	1	2.319556	0.43112
2N2907A	291	AN/ARN-118	T018	Si	JANTX	AUC	71A	0.40000	0.117	--	2455	0	2.319156	--
2N2907A	291	AN/ARN-118	T018	Si	JANTX	AUC	71A	0.40000	0.200	--	2455	1	2.319556	0.43112
2N2907A	291	AN/ARN-118	T018	Si	JANTX	AUC	71A	0.40000	0.202	0.017	4910	0	4.638311	--
2N2907A	291	AN/ARN-118	T018	Si	JANTX	AUC	71A	0.40000	0.067	0.005	2455	0	2.319156	--
2N2907A	291	AN/ARN-118	T018	Si	JANTX	AUC	71A	0.40000	0.200	0.005	2455	0	2.319556	--
2N2907A	291	AN/ARN-118	T018	Si	JANTX	AUC	71A	0.40000	0.250	0.017	2455	0	2.319156	--
2N2907A	291	AN/ARN-118	T018	Si	JANTX	AUC	71A	0.40000	0.233	0.017	7365	0	6.957467	--
2N2907A	291	AN/ARN-118	T018	Si	JANTX	AUC	71A	0.40000	0.403	0.017	9819	4	9.276223	0.43121

Transistor Section

Test Type : FIELD

Device : TRANSISTOR, BIPOLAR, PNP (CONTINUED FROM PREVIOUS PAGE)

Part Number	Slash Number	Equipment Reference	Package Type	Semi. Material	Quality Level	App Env	Temp °C	Rated Power (W)	Voltage Stress	Current Stress	Parts Tested	Number Failed	Part Hours	Failure Rate (f/10E6 Hrs)
2N2907A	291	AN/ARN-118	TO18	Si	JANTX	AUC	71A	0.40000	0.033	--	2455	1	2.319556	0.43112
2N2907A	291	AN/ARN-118	TO18	Si	JANTX	AUC	71A	0.40000	0.197	0.002	2455	0	2.319156	--
2N2907A	291	AN/ARN-118	TO18	Si	JANTX	AUC	71A	0.40000	0.083	0.008	2455	2	2.319156	0.86238
2N2907A	291	AN/ARN-118	TO18	Si	JANTX	AUC	71A	0.40000	0.250	0.017	2455	0	2.319156	--
2N2907A	291	AN/ARN-118	TO18	Si	JANTX	AUC	71A	0.40000	0.083	0.017	2455	1	2.319556	0.43112
2N2907A	291	AN/ARN-118	TO18	Si	JANTX	AUC	71A	0.40000	0.200	0.010	2455	0	2.319556	--
2N2907A	291	AN/ARN-118	TO18	Si	JANTX	AUC	71A	0.40000	0.203	0.002	2455	0	2.319556	--
2N2907A	291	AN/ARN-118	TO18	Si	JANTX	AUC	71A	0.40000	0.167	0.002	2455	0	2.319556	--
2N2907A	291	AN/ARN-118	TO18	Si	JANTX	AUC	71A	0.40000	0.117	0.017	2455	0	2.319556	--
2N2907A	291	AN/ARN-118	TO18	Si	JANTX	AUC	71A	0.40000	0.005	0.003	2455	0	2.319156	--
2N2907A	291	AN/ARN-118	TO18	Si	JANTX	AUC	71A	0.40000	0.012	0.005	4910	0	4.638311	--
2N2907A	291	AN/ARN-118	TO18	Si	JANTX	AUC	71A	0.40000	0.183	0.017	2455	0	2.319556	--
2N2907A	291	AN/ARN-118	TO18	Si	JANTX	AUC	71A	0.40000	0.200	0.005	2455	0	2.319556	--
2N2907A	291	AN/ARN-118	TO18	Si	JANTX	AUC	71A	0.40000	0.287	0.002	2455	0	2.319556	--
2N2907A	291	AN/ARN-118	TO18	Si	JANTX	AUT	71A	0.40000	0.245	0.100	8460	0	12.434499	--
2N2907A	291	AN/ARN-118	TO18	Si	JANTX	AUT	71A	0.40000	0.183	0.017	1018	0	1.496745	--
2N2907A	291	AN/ARN-118	TO18	Si	JANTX	AUT	71A	0.40000	0.197	0.002	1018	0	1.496745	--
2N2907A	291	AN/ARN-118	TO18	Si	JANTX	AUT	71A	0.40000	0.167	0.002	1018	0	1.496745	--
2N2907A	291	AN/ARN-118	TO18	Si	JANTX	AUT	71A	0.40000	0.200	0.017	1018	0	1.496745	--
2N2907A	291	AN/ARN-118	TO18	Si	JANTX	AUT	71A	0.40000	0.400	--	2037	0	2.993491	--
2N2907A	291	AN/ARN-118	TO18	Si	JANTX	AUT	71A	0.40000	0.233	0.017	1018	0	1.496745	--
2N2907A	291	AN/ARN-118	TO18	Si	JANTX	AUT	71A	0.40000	0.005	0.003	1018	0	1.496745	--
2N2907A	291	AN/ARN-118	TO18	Si	JANTX	AUT	71A	0.40000	0.083	0.017	1018	0	1.496745	--
2N2907A	291	AN/ARN-118	TO18	Si	JANTX	AUT	71A	0.40000	0.287	0.002	1018	0	1.496745	--
2N2907A	291	AN/ARN-118	TO18	Si	JANTX	AUT	71A	0.40000	0.250	0.017	1018	0	1.496745	--
2N2907A	291	AN/ARN-118	TO18	Si	JANTX	AUT	71A	0.40000	0.403	0.017	4073	0	5.986981	--
2N2907A	291	AN/ARN-118	TO18	Si	JANTX	AUT	71A	0.40000	0.183	0.017	1018	0	1.496745	--
2N2907A	291	AN/ARN-118	TO18	Si	JANTX	AUT	71A	0.40000	0.117	0.017	1018	0	1.496745	--
2N2907A	291	AN/ARN-118	TO18	Si	JANTX	AUT	71A	0.40000	0.017	--	1018	0	1.496745	--
2N2907A	291	AN/ARN-118	TO18	Si	JANTX	AUT	71A	0.40000	0.117	--	1018	0	1.496745	--
2N2907A	291	AN/ARN-118	TO18	Si	JANTX	AUT	71A	0.40000	0.083	0.008	1018	2	1.496745	1.33623
2N2907A	291	AN/ARN-118	TO18	Si	JANTX	AUT	71A	0.40000	0.202	0.017	2037	0	2.993491	--
2N2907A	291	AN/ARN-118	TO18	Si	JANTX	AUT	71A	0.40000	0.033	--	1018	1	1.496745	0.66812

Transistor Section

Test Type : FIELD

Device : TRANSISTOR, BIPOLAR, PNP (CONTINUED FROM PREVIOUS PAGE)

Part Number	Slash Number	Equipment Reference	Package Type	Semi-Material	Quality Level	App Env	Temp °C	Rated Power (W)	Voltane Stress	Current Stress	Parts Tested	Number Failed	Part Hours	Failure Rate (f/10E6 Hrs)
2N2907A	291	AN/ARN-118	T018	Si	JANTX	AUT	71A	0.40000	0.200	0.005	1018	0	1.496745	--
2N2907A	291	AN/ARN-118	T018	Si	JANTX	AUT	71A	0.40000	0.012	0.005	2037	1	2.993491	0.33406
2N2907A	291	AN/ARN-118	T018	Si	JANTX	AUT	71A	0.40000	0.217	0.003	1018	2	1.496745	1.33623
2N2907A	291	AN/ARN-118	T018	Si	JANTX	AUT	71A	0.40000	0.233	0.017	3055	0	4.490236	--
2N2907A	291	AN/ARN-118	T018	Si	JANTX	AUT	71A	0.40000	0.203	0.002	1018	1	1.496745	0.66812
2N2907A	291	AN/ARN-118	T018	Si	JANTX	AUT	71A	0.40000	0.200	0.010	1018	0	1.496745	--
2N2907A	291	AN/ARN-118	T018	Si	JANTX	AUT	71A	0.40000	0.067	0.005	1018	0	1.496745	--
2N2907A	291	AN/ARN-118	T018	Si	JANTX	AUT	71A	0.40000	0.200	--	1018	0	1.496745	--
2N2907A	291	AN/ARN-118	T018	Si	JANTX	AUT	71A	0.40000	0.250	0.017	1018	0	1.496745	--
2N2907A	291	AN/ARN-118	T018	Si	JANTX	AUT	71A	0.40000	0.200	--	1018	0	1.496745	--
2N2907A	291	AN/ARN-118	T018	Si	JANTX	AUT	71A	0.40000	0.245	0.100	3384	0	5.118642	--
2N2907A	291	AN/ARN-118	T018	Si	JANTX	AUT	71A	0.40000	0.200	0.017	407	0	0.616133	--
2N2907A	291	AN/ARN-118	T018	Si	JANTX	AUT	71A	0.40000	0.400	--	815	0	1.232266	--
2N2907A	291	AN/ARN-118	T018	Si	JANTX	AUT	71A	0.40000	0.197	0.002	407	0	0.616133	--
2N2907A	291	AN/ARN-118	T018	Si	JANTX	AUT	71A	0.40000	0.083	0.008	407	0	0.616133	--
2N2907A	291	AN/ARN-118	T018	Si	JANTX	AUT	71A	0.40000	0.200	--	407	1	0.616133	1.62303
2N2907A	291	AN/ARN-118	T018	Si	JANTX	AUT	71A	0.40000	0.200	--	407	0	0.616133	--
2N2907A	291	AN/ARN-118	T018	Si	JANTX	AUT	71A	0.40000	0.287	0.002	407	0	0.616133	--
2N2907A	291	AN/ARN-118	T018	Si	JANTX	AUT	71A	0.40000	0.005	0.003	407	0	0.616133	--
2N2907A	291	AN/ARN-118	T018	Si	JANTX	AUT	71A	0.40000	0.200	0.005	407	0	0.616133	--
2N2907A	291	AN/ARN-118	T018	Si	JANTX	AUT	71A	0.40000	0.083	0.017	407	0	0.616133	--
2N2907A	291	AN/ARN-118	T018	Si	JANTX	AUT	71A	0.40000	0.200	0.005	407	0	0.616133	--
2N2907A	291	AN/ARN-118	T018	Si	JANTX	AUT	71A	0.40000	0.403	0.017	1629	0	2.464531	--
2N2907A	291	AN/ARN-118	T018	Si	JANTX	AUT	71A	0.40000	0.233	0.017	407	0	0.616133	--
2N2907A	291	AN/ARN-118	T018	Si	JANTX	AUT	71A	0.40000	0.183	0.017	407	0	0.616133	--
2N2907A	291	AN/ARN-118	T018	Si	JANTX	AUT	71A	0.40000	0.250	0.017	407	0	0.616133	--
2N2907A	291	AN/ARN-118	T018	Si	JANTX	AUT	71A	0.40000	0.202	0.017	815	0	1.232266	--
2N2907A	291	AN/ARN-118	T018	Si	JANTX	AUT	71A	0.40000	0.217	0.003	407	0	0.616133	--
2N2907A	291	AN/ARN-118	T018	Si	JANTX	AUT	71A	0.40000	0.233	0.017	1222	1	1.848398	0.54101
2N2907A	291	AN/ARN-118	T018	Si	JANTX	AUT	71A	0.40000	0.200	0.010	407	0	0.616133	--
2N2907A	291	AN/ARN-118	T018	Si	JANTX	AUT	71A	0.40000	0.033	--	407	0	0.616133	--

Transistor Section

Test Type : FIELD

Device : TRANSISTOR, BIPOLAR, PNP (CONTINUED FROM PREVIOUS PAGE)

Part Number	Slash Number	Equipment Reference	Package Type	Semi. Material	Quality Level	App Env	Temp °C	Rated Power (W)	Voltage Stress	Current Stress	Parts Tested	Number Failed	Part Hours (E06)	Failure Rate (f/10E6 Hrs)
2N2907A	291	AN/ARN-118	T018	Si	JANTX	AUA	71A	0.40000	0.233	0.017	705	0	0.547069	--
2N2907A	291	AN/ARN-118	T018	Si	JANTX	AUA	71A	0.40000	0.183	0.017	705	0	0.547069	--
2N2907A	291	AN/ARN-118	T018	Si	JANTX	AUA	71A	0.40000	0.117	--	705	0	0.547069	--
2N2907A	291	AN/ARN-118	T018	Si	JANTX	AUA	71A	0.40000	0.202	0.017	1410	0	1.094138	--
2N2907A	291	AN/ARN-118	T018	Si	JANTX	AUF	71A	0.40000	0.400	--	3144	0	1.841203	--
2N2907A	291	AN/ARN-118	T018	Si	JANTX	AUF	71A	0.40000	0.245	0.100	13059	1	7.632207	0.13102
2N2907A	291	AN/ARN-118	T018	Si	JANTX	AUF	71A	0.40000	0.183	0.017	1573	0	0.920602	--
2N2907A	291	AN/ARN-118	T018	Si	JANTX	AUF	71A	0.40000	0.197	0.002	1573	0	0.920602	--
2N2907A	291	AN/ARN-118	T018	Si	JANTX	AUF	71A	0.40000	0.203	0.002	1573	0	0.920602	--
2N2907A	291	AN/ARN-118	T018	Si	JANTX	AUF	71A	0.40000	0.067	0.005	1573	0	0.920602	--
2N2907A	291	AN/ARN-118	T018	Si	JANTX	AUF	71A	0.40000	0.200	0.005	1573	0	0.920602	--
2N2907A	291	AN/ARN-118	T018	Si	JANTX	AUF	71A	0.40000	0.250	0.017	1572	0	0.920602	--
2N2907A	291	AN/ARN-118	T018	Si	JANTX	AUF	71A	0.40000	0.183	0.017	1573	0	0.920602	--
2N2907A	291	AN/ARN-118	T018	Si	JANTX	AUF	71A	0.40000	0.250	0.017	1572	0	0.920602	--
2N2907A	291	AN/ARN-118	T018	Si	JANTX	AUF	71A	0.40000	0.200	0.005	1573	0	0.920602	--
2N2907A	291	AN/ARN-118	T018	Si	JANTX	AUF	71A	0.40000	0.083	0.017	1573	0	0.920602	--
2N2907A	291	AN/ARN-118	T018	Si	JANTX	AUF	71A	0.40000	0.200	--	1572	0	0.920602	--
2N2907A	291	AN/ARN-118	T018	Si	JANTX	AUF	71A	0.40000	0.203	0.002	1573	0	0.920602	--
2N2907A	291	AN/ARN-118	T018	Si	JANTX	AUF	71A	0.40000	0.233	0.017	1573	0	0.920602	--
2N2907A	291	AN/ARN-118	T018	Si	JANTX	AUF	71A	0.40000	0.083	0.008	1572	1	0.920602	1.08625
2N2907A	291	AN/ARN-118	T018	Si	JANTX	AUF	71A	0.40000	0.117	--	1573	0	0.920602	--
2N2907A	291	AN/ARN-118	T018	Si	JANTX	AUF	71A	0.40000	0.012	0.005	3144	0	1.841203	--
2N2907A	291	AN/ARN-118	T018	Si	JANTX	AUF	71A	0.40000	0.202	0.017	3144	0	1.841203	--
2N2907A	291	AN/ARN-118	T018	Si	JANTX	AUF	71A	0.40000	0.033	--	1573	0	0.920600	--
2N2907A	291	AN/ARN-118	T018	Si	JANTX	AUF	71A	0.40000	0.167	0.002	1573	0	0.920602	--
2N2907A	291	AN/ARN-118	T018	Si	JANTX	AUF	71A	0.40000	0.117	0.017	1573	0	0.920602	--
2N2907A	291	AN/ARN-118	T018	Si	JANTX	AUF	71A	0.40000	0.200	0.017	1573	0	0.920602	--
2N2907A	291	AN/ARN-118	T018	Si	JANTX	AUF	71A	0.40000	0.200	--	1573	0	0.920602	--
2N2907A	291	AN/ARN-118	T018	Si	JANTX	AUF	71A	0.40000	0.005	0.003	1572	0	0.920602	--
2N2907A	291	AN/ARN-118	T018	Si	JANTX	AUF	71A	0.40000	0.200	0.010	1573	0	0.920602	--
2N2907A	291	AN/ARN-118	T018	Si	JANTX	AUF	71A	0.40000	0.403	0.017	1573	1	0.920602	1.08625

Transistor Section

Test Type : FIELD

Device : TRANSISTOR, BIPOLAR, PNP (CONTINUED FROM PREVIOUS PAGE)

Part Number	Slash Number	Equipment Reference	Package Type	Semi. Material	Quality Level	App Env	Temp °C	Rated Power (W)	Voltage Stress	Current Stress	Parts Tested	Number Failed	Part Hours (E06)	Failure Rate (f/10E6 Hrs)
2N2907A	291	AN/ARN-118	T018	Si	JANTX	AUF	71A	0.40000	0.217	0.003	1573	0	0.920602	--
2N2907A	291	AN/ARN-118	T018	Si	JANTX	AUF	71A	0.40000	0.233	0.017	4716	0	2.761804	--
2N2907A	291	F-16 HUD	T018	Si	JANTX	AIF	40A	0.40000	--	--	7112	38	3.868867	9.82200
2N2907A	291	F-16 FCC	T018	Si	JANTX	AIF	40A	0.40000	--	--	9253	6	4.038962	1.48553
2N2907A	291	COMMERCIAL	T018	Si	PLASTIC	GB	40A	0.40000	--	--	1534067	258	1994.287100	0.12937
2N2946A	382	F-16 FCC	T046	Si	JANTX	AIF	40A	0.40000	--	--	7305	0	3.188632	--
2N3134	--	COMMERCIAL	T05	Si	PLASTIC	GB	40A	0.60000	--	--	46486	4	60.431800	0.06619
2N3251	323	AN/ARN-118	T018	Si	JANTX	AUC	71A	0.36000	--	--	9064	0	8.563036	--
2N3251	323	AN/ARN-118	T018	Si	JANTX	AUT	71A	0.36000	--	--	3760	0	5.526444	--
2N3251	323	AN/ARN-118	T018	Si	JANTX	AUB	71A	0.36000	--	--	1504	0	2.274952	--
2N3251	323	AN/ARN-118	T018	Si	JANTX	AUA	71A	0.36000	--	--	2604	0	2.019948	--
2N3251	323	AN/ARN-118	T018	Si	JANTX	AUF	71A	0.36000	--	--	5804	0	3.399144	--
2N3251	323	COMMERCIAL	T018	Si	PLASTIC	GB	40A	0.36000	--	--	2902019	199	3772.624700	0.05275
2N344	--	AN/ARN-118	T024	Ge	JTX EQU	AUC	71A	0.02000	--	--	2266	5	2.140759	2.33562
2N344	--	AN/ARN-118	T024	Ge	JTX EQU	AUC	71A	0.02000	--	--	2266	0	2.140759	--
2N344	--	AN/ARN-118	T024	Ge	JTX EQU	AUC	71A	0.02000	--	0.200	2266	5	2.140759	2.33562
2N344	--	AN/ARN-118	T024	Ge	JTX EQU	AUC	71A	0.02000	--	--	4532	0	4.281518	--
2N344	--	AN/ARN-118	T024	Ge	JTX EQU	AUT	71A	0.02000	--	--	1880	0	2.763222	--
2N344	--	AN/ARN-118	T024	Ge	JTX EQU	AUT	71A	0.02000	--	--	940	0	1.381611	--
2N344	--	AN/ARN-118	T024	Ge	JTX EQU	AUT	71A	0.02000	--	--	940	0	1.381611	--
2N344	--	AN/ARN-118	T024	Ge	JTX EQU	AUT	71A	0.02000	--	0.200	940	0	1.381611	--
2N344	--	AN/ARN-118	T024	Ge	JTX EQU	AUB	71A	0.02000	--	--	376	0	0.568738	--
2N344	--	AN/ARN-118	T024	Ge	JTX EQU	AUB	71A	0.02000	--	0.200	376	0	0.568738	--
2N344	--	AN/ARN-118	T024	Ge	JTX EQU	AUB	71A	0.02000	--	--	376	0	0.568738	--
2N344	--	AN/ARN-118	T024	Ge	JTX EQU	AUB	71A	0.02000	--	--	752	0	1.137476	--
2N344	--	AN/ARN-118	T024	Ge	JTX EQU	AUA	71A	0.02000	--	--	651	0	0.504981	--
2N344	--	AN/ARN-118	T024	Ge	JTX EQU	AUA	71A	0.02000	--	--	1302	0	1.009974	--
2N344	--	AN/ARN-118	T024	Ge	JTX EQU	AUA	71A	0.02000	--	0.200	651	0	0.504981	--
2N344	--	AN/ARN-118	T024	Ge	JTX EQU	AUA	71A	0.02000	--	--	651	1	0.504981	1.98027
2N344	--	AN/ARN-118	T024	Ge	JTX EQU	AUF	71A	0.02000	--	--	2902	0	1.699572	--
2N344	--	AN/ARN-118	T024	Ge	JTX EQU	AUF	71A	0.02000	--	0.200	1451	0	0.848023	--
2N344	--	AN/ARN-118	T024	Ge	JTX EQU	AUF	71A	0.02000	--	--	1451	1	0.848023	1.17921
2N344	--	AN/ARN-118	T024	Ge	JTX EQU	AUF	71A	0.02000	--	--	1451	0	0.848023	--

Transistor Section

Test Type : FIELD

Device : TRANSISTOR, BIPOLAR, PNP (CONTINUED FROM PREVIOUS PAGE)

Part Number	Slash Number	Equipment Reference	Package Type	Semi. Material	Quality Level	App Env	Temp °C	Rated Power (W)	Voltage Stress	Current Stress	Parts Tested	Number Failed	Part Hours (E06)	Failure Rate (f/10E6 Hrs)
2N3637	357	F-16 HUD	T05	Si	JANTX	AIF	40A	1.00000	--	--	3048	0	1.658110	--
2N3638	--	COMMERCIAL	T092	Si	PLASTIC	GB	40A	0.30000	--	--	1113506	89	1447.557800	0.06148
2N3640	--	COMMERCIAL	T092	Si	PLASTIC	GB	40A	0.20000	--	--	1247549	99	1621.813700	0.06104
2N3644	--	COMMERCIAL	T092	Si	PLASTIC	GB	40A	0.30000	--	--	183495	12	238.543500	0.05031
2N3645	--	COMMERCIAL	T092	Si	PLASTIC	GB	40A	0.30000	--	--	14122	5	18.358600	0.27235
2N3740	441	F-16 FCC	T066	Si	JANTX	AIF	40A	25.00000	--	--	487	0	0.212575	--
2N3740	441	COMMERCIAL	T066	Si	PLASTIC	GB	40A	25.00000	--	--	178668	48	232.268400	0.20666
2N3741	441	AN/ARN-118	T066	Si	JANTX	AUC	71A	25.00000	0.212	0.505	11330	4	10.703795	0.37370
2N3741	441	AN/ARN-118	T066	Si	JANTX	AUT	71A	25.00000	0.212	0.505	4700	4	6.908055	0.57903
2N3741	441	AN/ARN-118	T066	Si	JANTX	AUB	71A	25.00000	0.212	0.505	1880	2	2.843690	0.70331
2N3741	441	AN/ARN-118	T066	Si	JANTX	AUA	71A	25.00000	0.212	0.505	3255	2	2.524935	0.79210
2N3741	441	AN/ARN-118	T066	Si	JANTX	AUF	71A	25.00000	0.212	0.505	7255	1	4.248930	0.23535
2N3789	--	COMMERCIAL	T03	Si	PLASTIC	GB	40A	15.00000	--	--	1854	0	2.410200	--
2N3791	379	COMMERCIAL	T03	Si	PLASTIC	GB	40A	150.00000	--	--	50642	12	65.834600	0.18227
2N3792	390	COMMERCIAL	T05	Si	PLASTIC	GB	40A	150.00000	--	--	7208	1	9.370400	0.10672
2N3799	--	COMMERCIAL	T018	Si	PLASTIC	GB	40A	0.36000	--	--	433880	16	564.044000	0.02837
2N3799A	--	COMMERCIAL	T018	Si	PLASTIC	GB	40A	0.36000	--	--	20040	0	26.052000	--
2N3809	--	COMMERCIAL	R131C	Si	PLASTIC	GB	40A	0.50000	--	--	6986	0	9.081800	--
2N3810	336	F-16 FCC	T099	Si	JANTX	AIF	40A	0.50000	--	--	974	0	0.425151	--
2N3867	350	F-16 FCC	T05	Si	JANTX	AIF	40A	10.00000	--	--	2435	19	1.062800	17.87731
2N3906	350	COMMERCIAL	T092	Si	PLASTIC	GB	40A	0.25000	--	--	6333208	628	8233.170400	0.07628
2N3913	--	AN/ARN-118	T018	Si	JTX EQU	AUC	71A	0.40000	0.188	0.067	13596	0	12.844554	--
2N3913	--	AN/ARN-118	T018	Si	JTX EQU	AUC	71A	0.40000	0.188	0.065	13596	1	12.844554	0.07785
2N3913	--	AN/ARN-118	T018	Si	JTX EQU	AUT	71A	0.40000	0.188	0.065	5640	0	8.289666	--
2N3913	--	AN/ARN-118	T018	Si	JTX EQU	AUT	71A	0.40000	0.188	0.067	5640	0	8.289666	--
2N3913	--	AN/ARN-118	T018	Si	JTX EQU	AUB	71A	0.40000	0.188	0.067	2256	0	3.412428	--
2N3913	--	AN/ARN-118	T018	Si	JTX EQU	AUB	71A	0.40000	0.188	0.065	2256	0	3.412428	--
2N3913	--	AN/ARN-118	T018	Si	JTX EQU	AUA	71A	0.40000	0.188	0.065	3906	1	3.029922	0.33004
2N3913	--	AN/ARN-118	T018	Si	JTX EQU	AUA	71A	0.40000	0.188	0.067	3906	0	3.029922	--
2N3913	--	AN/ARN-118	T018	Si	JTX EQU	AUF	71A	0.40000	0.188	0.065	8706	1	5.088138	0.19654
2N3913	--	AN/ARN-118	T018	Si	JTX EQU	AUF	71A	0.40000	0.188	0.067	8706	1	5.098716	0.19613

Transistor Section

Test type : FIELD

Device : TRANSISTOR, BIPOLAR, PNP (CONTINUED FROM PREVIOUS PAGE)

Part Number	Slash Number	Equipment Reference	Package Type	Semi. Material	Quality Level	App Env	Temp °C	Rated Power (W)	Voltage Stress	Current Stress	Parts Tested	Number Failed	Part Hours (E06)	Failure Rate (f/10E6 Hrs)
2N4032	--	COMMERCIAL	T03	Si	PLASTIC	GB	40A	0.80000	--	--	22302	3	28.992600	0.10347
2N4033	512	AN/ARN-118	T05	Si	JANTX	AUC	71A	0.80000	0.894	0.001	2266	3	2.140759	1.40137
2N4033	512	AN/ARN-118	T05	Si	JANTX	AUT	71A	0.80000	0.894	0.001	3760	5	5.526444	0.90474
2N4033	512	AN/ARN-118	T05	Si	JANTX	AUB	71A	0.80000	0.894	0.001	1504	2	2.274952	0.87914
2N4033	512	AN/ARN-118	T05	Si	JANTX	AUA	71A	0.80000	0.894	0.001	2604	3	2.019948	1.48519
2N4033	512	AN/ARN-118	T05	Si	JANTX	AUF	71A	0.80000	0.894	0.001	5804	3	3.399144	0.88258
2N4036	--	COMMERCIAL	T03	Si	PLASTIC	GB	40A	7.00000	--	--	68210	6	88.673000	0.06766
2N4037	--	COMMERCIAL	T03	Si	PLASTIC	GB	40A	7.00000	--	--	86563	16	112.531900	0.14218
2N4234	--	COMMERCIAL	T05	Si	PLASTIC	GB	40A	1.00000	--	--	2872	1	3.733600	0.26784
2N4236	--	COMMERCIAL	T05	Si	PLASTIC	GB	40A	1.00000	--	--	96215	32	125.079500	0.25584
2N4250	--	COMMERCIAL	T092	Si	PLASTIC	GB	40A	0.20000	--	--	497906	36	647.277800	0.05562
2N4403	--	COMMERCIAL	T092	Si	PLASTIC	GB	40A	1.50000	--	--	116155	5	151.001500	0.03311
2N441	--	COMMERCIAL	T03	Ge	PLASTIC	GB	40A	1.00000	--	--	3496	3	4.544800	0.66010
2N4888	--	COMMERCIAL	R1248B	Si	PLASTIC	GB	40A	0.30000	--	--	105779	12	137.512700	0.08726
2N4917	--	COMMERCIAL	T0106	Si	PLASTIC	GB	40A	0.20000	--	--	1224732	187	1592.151600	0.11745
2N4918	--	COMMERCIAL	T0126	Si	PLASTIC	GB	40A	30.00000	--	--	29544	65	38.407200	1.69239
2N4919	--	COMMERCIAL	T0126	Si	PLASTIC	GB	40A	30.00000	--	--	13812	0	17.955600	--
2N5086	--	COMMERCIAL	T092	Si	PLASTIC	GB	40A	0.35000	--	--	2372	0	3.083600	--
2N5087	--	COMMERCIAL	T092	Si	PLASTIC	GB	40A	0.35000	--	--	1380502	218	1794.652600	0.12147
2N508A	--	COMMERCIAL	T05	Ge	PLASTIC	GB	40A	0.20000	--	--	8894	8	11.562200	0.69191
2N5194	--	COMMERCIAL	T0126	Si	PLASTIC	GB	40A	40.00000	--	--	65595	5	85.273500	0.05863
2N5401	--	COMMERCIAL	T092	Si	PLASTIC	GB	40A	0.62500	--	--	87376	1	113.588800	0.00880
2N5416	485	COMMERCIAL	T039	Si	PLASTIC	GB	40A	1.00000	--	--	17821	9	23.167300	0.38848
2N5875	--	COMMERCIAL	T03	Si	PLASTIC	GB	40A	150.00000	--	--	28208	3	36.670400	0.08181
2N5876	--	COMMERCIAL	T03	Si	PLASTIC	GB	40A	150.00000	--	--	36081	3	46.905300	0.06396
2N5884	--	COMMERCIAL	T03	Si	PLASTIC	GB	40A	200.00000	--	--	27061	7	35.179300	0.19898
2N5954	--	COMMERCIAL	T066	Si	PLASTIC	GB	40A	90.00000	--	--	20306	15	26.397800	0.56823
2N5956	--	COMMERCIAL	T066	Si	PLASTIC	GB	40A	90.00000	--	--	15793	10	20.530900	0.48707
2N5987	--	COMMERCIAL	T0127	Si	PLASTIC	GB	40A	100.00000	--	--	18	0	0.023400	--
2N6049	--	COMMERCIAL	T066	Si	PLASTIC	GB	40A	75.00000	--	--	4616	0	6.000800	--
2N6049	--	COMMERCIAL	T066	Si	PLASTIC	GB	40A	75.00000	--	--	4616	0	6.000800	--
2N6051	--	COMMERCIAL	T03	Si	PLASTIC	GB	40A	150.00000	--	--	2551	0	3.316300	--
2N6053	--	AN/BRD-7	T066	Si	JAN EQU	NSB	25A	100.00000	--	--	112	0	0.355580	--

Transistor Section

Test Type : FIELD

Device : TRANSISTOR, BIPOLAR, PNP (CONTINUED FROM PREVIOUS PAGE)

Part Number	Slash Number	Equipment Reference	Package Type	Semi. Material	Quality Level	App Env	Temp °C	Rated Power (W)	Voltage Stress	Current Stress	Parts Tested	Number Failed	Part Hours (E06)	Failure Rate (f/10E6 Hrs)
2N6053	--	AN/BRD-7	T066	Si	JAN EQU	NSB	25A	100.00000	--	--	1008	3	3.200220	0.93744
2N6053	--	COMMERCIAL	T066	Si	JAN EQU	GB	40A	100.00000	--	--	51931	51	67.510300	0.75544
2N6107	--	COMMERCIAL	T0220	Si	PLASTIC	GB	40A	40.00000	--	--	7636	0	9.926800	--
2N6211	46	F-16 HUD	T066	Si	JANTX	AIF	40A	20.00000	--	--	508	0	0.276358	--
2N6211	461	COMMERCIAL	T066	Si	PLASTIC	GB	40A	20.00000	--	--	4398	12	5.717400	2.09886
2N6248	--	COMMERCIAL	T0204	Si	PLASTIC	GB	40A	180.00000	--	--	62	0	0.080600	--
2N6296	--	COMMERCIAL	T066	Si	PLASTIC	GB	40A	50.00000	--	--	3242	0	4.214600	--
2N6423	--	COMMERCIAL	T066	Si	PLASTIC	GB	40A	35.00000	--	--	16206	1	21.067800	0.04747
2N779A	--	COMMERCIAL	T018	Ge	PLASTIC	GB	40A	0.06000	--	--	2394	0	3.112200	--
2N964	258	COMMERCIAL	T018	Ge	PLASTIC	GB	40A	0.15000	--	--	6851	1	8.906300	0.11228
STA7221	--	F-16 FCC	T066	Si	JTX EQU	AIF	40A	50.00000	--	--	974	0	0.425151	--

Test Type : FIELD

Device : TRANSISTOR, FIELD EFFECT, JUNCTION, N-CHANNEL

Part Number	Slash Number	Equipment Reference	Package Type	Semi. Material	Quality Level	App Env	Temp °C	Rated Power (W)	Voltage Stress	Current Stress	Parts Tested	Number Failed	Part Hours (E06)	Failure Rate (f/10E6 Hrs)
2N3823	375	AN/BRD-7	T072	Si	JANTX	NSB	25A	0.30000	--	--	252	0	0.800055	--
2N3922	--	COMMERCIAL	T071	Si	PLASTIC	GB	40A	0.25000	--	--	371	0	0.482300	--
2N3955	--	COMMERCIAL	T071	Si	PLASTIC	GB	40A	0.25000	--	--	1654	1	2.150200	0.46507
2N3972	--	AN/ARN-118	T018	Si	JTX EQU	AUC	71A	1.80000	--	--	20394	7	19.266831	0.36332
2N3972	--	AN/ARN-118	T018	Si	JTX EQU	AUC	71A	1.80000	0.150	0.200	2266	0	2.140759	--
2N3972	--	AN/ARN-118	T018	Si	JTX EQU	AUT	71A	1.80000	--	--	8460	3	12.434499	0.24126
2N3972	--	AN/ARN-118	T018	Si	JTX EQU	AUT	71A	1.80000	0.150	0.200	940	0	1.381611	--
2N3972	--	AN/ARN-118	T018	Si	JTX EQU	AUB	71A	1.80000	0.150	--	376	0	0.568738	--
2N3972	--	AN/ARN-118	T018	Si	JTX EQU	AUB	71A	1.80000	--	--	3384	0	5.118642	--
2N3972	--	AN/ARN-118	T018	Si	JTX EQU	AUA	71A	1.80000	--	--	5859	1	4.544883	0.22003
2N3972	--	AN/ARN-118	T018	Si	JTX EQU	AUA	71A	1.80000	0.150	0.200	651	0	0.504987	--
2N3972	--	AN/ARN-118	T018	Si	JTX EQU	AUF	71A	1.80000	0.150	0.200	1451	0	0.849786	--
2N3972	--	AN/ARN-118	T018	Si	JTX EQU	AUF	71A	1.80000	--	--	13059	0	7.632207	--
2N4092	431	AN/ARN-118	T018	Si	JANTX	AUC	71A	1.80000	0.258	--	11330	1	10.703795	0.09342

Transistor Section

Test Type : FIELD

Device : TRANSISTOR, FIELD EFFECT, JUNCTION, N-CHANNEL (CONTINUED FROM PREVIOUS PAGE)

Part Number	Slash Number	Equipment Reference	Package Type	Semi. Material	Quality Level	App Env	Temp °C	Rated Power (W)	Voltage Stress	Current Stress	Parts Tested	Number Failed	Part Hours (E06)	Failure Rate (f/10E6 Hrs)
2N4092	431	AN/ARN-118	T018	Si	JANTX	AUT	71A	1.80000	0.258	--	4700	1	6.908055	0.14476
2N4092	431	AN/ARN-118	T018	Si	JANTX	AUB	71A	1.80000	0.258	--	1880	0	2.843690	--
2N4092	431	AN/ARN-118	T018	Si	JANTX	AUA	71A	1.80000	0.258	--	3255	0	2.524935	--
2N4092	431	AN/ARN-118	T018	Si	JANTX	AUF	71A	1.80000	0.258	--	7255	1	4.248930	0.23535
2N4092	431	COMMERCIAL	T018	Si	PLASTIC	GB	40A	1.80000	--	--	467	0	0.607100	--
2N4117	--	COMMERCIAL	T072	Si	PLASTIC	GB	40A	0.30000	--	--	59924	38	77.901200	0.48780
2N4117A	--	COMMERCIAL	T072	Si	PLASTIC	GB	40A	0.30000	--	--	39108	0	50.840400	--
2N4391	--	COMMERCIAL	T018	Si	PLASTIC	GB	40A	1.80000	--	--	792122	137	1029.758600	0.13304
2N4392	--	COMMERCIAL	T018	Si	PLASTIC	GB	40A	1.80000	--	--	336155	127	437.001500	0.29062
2N4393	--	COMMERCIAL	T018	Si	PLASTIC	GB	40A	1.80000	--	--	1071301	93	1392.691300	0.06678
2N4416A	428	AN/BRD-7	T072	Si	JANTX	NSB	25A	0.30000	--	--	28	0	0.088895	--
2N4856	385	AN/BRD-7	T018	Si	JANTX	NSB	25A	0.36000	--	--	56	0	0.177790	--
2N4856	385	COMMERCIAL	T018	Si	PLASTIC	GB	40A	0.36000	--	--	4072	0	5.293600	--
2N4857	--	COMMERCIAL	T018	Si	PLASTIC	GB	40A	0.36000	--	--	20916	20	27.190800	0.73554
2N4858	385	AN/BRD-7	T018	Si	JANTX	NSB	25A	0.36000	--	--	252	0	0.800055	--
2N4858	385	F-16 FCC	T018	Si	JANTX	A1F	40A	0.36000	--	--	11201	15	4.889270	3.06794
2N5245	--	COMMERCIAL	T092	Si	PLASTIC	GB	40A	0.36000	--	--	1485011	419	1930.514300	0.21704
3N215	--	COMMERCIAL	T072	Si	PLASTIC	GB	40A	0.36000	--	--	4093	0	5.320900	--

Test Type : FIELD

Device : TRANSISTOR, FIELD EFFECT, JUNCTION, P-CHANNEL

Part Number	Slash Number	Equipment Reference	Package Type	Semi. Material	Quality Level	App Env	Temp °C	Rated Power (W)	Voltage Stress	Current Stress	Parts Tested	Number Failed	Part Hours (E06)	Failure Rate (f/10E6 Hrs)
2N2608	295	AN/ARN-118	T018	Si	JANTX	AUC	71A	0.30000	0.067	--	2266	2	2.140759	0.93425
2N2608	295	AN/ARN-118	T018	Si	JANTX	AUT	71A	0.30000	0.067	--	940	0	1.381611	--
2N2608	295	AN/ARN-118	T018	Si	JANTX	AUB	71A	0.30000	0.067	--	376	0	0.568738	--
2N2608	295	AN/ARN-118	T018	Si	JANTX	AUA	71A	0.30000	0.067	--	651	1	0.504987	1.98025
2N2608	295	AN/ARN-118	T018	Si	JANTX	AUF	71A	0.30000	0.067	--	1451	2	0.849786	2.35353
2N3330	--	COMMERCIAL	T072	Si	PLASTIC	GB	40A	0.30000	--	--	149	0	0.193700	--
2N5114	--	COMMERCIAL	T018	Si	PLASTIC	GB	40A	0.50000	--	--	77127	3	100.265100	0.02992
2N5115	--	COMMERCIAL	T018	Si	PLASTIC	GB	40A	0.50000	--	--	22003	5	28.603900	0.17480
VCR3P2	--	F-16 HUD	T072	Si	--	A1F	40A	0.30000	--	--	1016	1	0.552697	1.80931

Transistor Section

Test Type : TEST

Device : TRANSISTOR, FIELD EFFECT, MOS, N-CHANNEL

Part Number	Slash Number	Equipment Reference	Package Type	Semi. Material	Quality Level	App Env	Temp °C	Rated Power (W)	Voltage Stress	Current Stress	Parts Tested	Number Failed	Part Hours (E06)	Failure Rate (f/10E6 Hrs)
2N6661	547	N/A	T03	Si	--	---	200J	6.25000	--	--	17	0	0.042500	--
2N6661	547	N/A	T03	Si	--	---	200J	6.25000	--	--	20	3	0.046300	64.79482
2N6661	547	N/A	T03	Si	--	---	200J	6.25000	--	--	17	2	0.039500	50.63291
2N6764	543	N/A	T03	Si	--	---	200J	150.00000	--	--	17	0	0.042500	--
2N6764	543	N/A	T03	Si	--	---	200J	150.00000	--	--	17	0	0.042500	--
2N6764	543	N/A	T03	Si	--	---	200J	150.00000	--	--	17	0	0.042500	--
2N6768	543	N/A	T03	Si	--	---	200J	150.00000	--	--	17	4	0.037300	107.23861
2N6768	543	N/A	T03	Si	--	---	200J	150.00000	--	--	17	0	0.042500	--
2N6768	543	N/A	T03	Si	--	---	200J	150.00000	--	--	17	1	0.042500	23.52941
HPWR-6503	--	N/A	T03	Si	--	---	200J	90.00000	--	--	17	0	0.042500	--
HPWR-6503	--	N/A	T03	Si	--	---	200J	90.00000	--	--	17	3	0.036300	82.64463
HPWR-6503	--	N/A	T03	Si	--	---	200J	90.00000	--	--	17	0	0.042500	--
MTM1224	--	N/A	T03	Si	--	---	200J	75.00000	--	--	17	0	0.042500	--
MTM1224	--	N/A	T03	Si	--	---	200J	75.00000	--	--	17	0	0.042500	--
MTM1224	--	N/A	T03	Si	--	---	200J	75.00000	--	--	17	9	0.032072	280.61861
VN4-000A	--	N/A	T03	Si	--	---	200J	125.00000	--	--	17	0	0.042500	--
VN4-000A	--	N/A	T03	Si	--	---	200J	125.00000	--	--	17	2	0.038596	51.81884
VN4-000A	--	N/A	T03	Si	--	---	200J	125.00000	--	--	17	0	0.042500	--

Test Type : FIELD

Device : TRANSISTOR, FIELD EFFECT, MOS, N-CHANNEL

Part Number	Slash Number	Equipment Reference	Package Type	Semi. Material	Quality Level	App Env	Temp °C	Rated Power (W)	Voltage Stress	Current Stress	Parts Tested	Number Failed	Part Hours (E06)	Failure Rate (f/10E6 Hrs)
2N4338	--	COMMERCIAL	T018	Si	PLASTIC	GB	40A	0.30000	--	--	76197	66	99.056100	0.66629
2N4351	--	COMMERCIAL	T072	Si	PLASTIC	GB	40A	0.30000	--	--	8380	1	10.894000	0.09179
2N5198	--	COMMERCIAL	T071	Si	PLASTIC	GB	40A	0.25000	--	--	23899	15	31.068700	0.48280
2N5565	--	COMMERCIAL	T071	Si	PLASTIC	GB	40A	0.32500	--	--	13058	1	16.975400	0.05891
2N5912	--	COMMERCIAL	T078	Si	PLASTIC	GB	40A	0.36700	--	--	139756	97	181.682800	0.53390
3N128	--	COMMERCIAL	T072	Si	PLASTIC	GB	40A	0.33000	--	--	8576	2	11.148800	0.17939
3N138	--	COMMERCIAL	T072	Si	PLASTIC	GB	40A	0.15000	--	--	1960	0	2.548000	--

Transistor Section

Test Type : TEST

Device : TRANSISTOR, FIELD EFFECT, MOS, P-CHANNEL

Part Number	Slash Number	Equipment Reference	Package Type	Semi. Material	Quality Level	App Env	Temp °C	Rated Power (W)	Voltage Stress	Current Stress	Parts Tested	Number Failed	Part Hours (E06)	Failure Rate (f/10E6 Hrs)
VP0109N2	--	N/A	T03	Si	--	---	200J	5.00000	--	--	17	0	0.042500	--
VP0109N2	--	N/A	T03	Si	--	---	200J	5.00000	--	--	17	0	0.042500	--
VP0109N2	--	N/A	T03	Si	--	---	200J	5.00000	--	--	17	1	0.040300	24.81390

Test Type : FIELD

Device : TRANSISTOR, FIELD EFFECT, MOS, P-CHANNEL

Part Number	Slash Number	Equipment Reference	Package Type	Semi. Material	Quality Level	App Env	Temp °C	Rated Power (W)	Voltage Stress	Current Stress	Parts Tested	Number Failed	Part Hours (E06)	Failure Rate (f/10E6 Hrs)
2N4352	--	COMMERCIAL	T072	Si	PLASTIC	GB	40A	0.80000	--	--	6074	4	7.896200	0.50657

Test Type : FIELD

Device : TRANSISTOR, UNI-JUNCTION

Part Number	Slash Number	Equipment Reference	Package Type	Semi. Material	Quality Level	App Env	Temp °C	Rated Power (W)	Voltage Stress	Current Stress	Parts Tested	Number Failed	Part Hours (E06)	Failure Rate (f/10E6 Hrs)
2N16716	--	COMMERCIAL	R33	Si	PLASTIC	GB	40A	0.45000	--	--	5218	3	6.783400	0.44226
2N2646	--	COMMERCIAL	T072	Si	PLASTIC	GB	40A	0.30000	--	--	29368	14	38.178400	0.36670
2N2647	--	AN/ARN-118	T072	Si	JTX EQU	AUC	71A	0.30000	--	--	2266	0	2.140759	--
2N2647	--	AN/ARN-118	T072	Si	JTX EQU	AUT	71A	0.30000	--	--	940	0	1.381611	--
2N2647	--	AN/ARN-118	T072	Si	JTX EQU	AUB	71A	0.30000	--	--	376	0	0.568738	--
2N2647	--	AN/ARN-118	T072	Si	JTX EQU	AUA	71A	0.30000	--	--	651	0	0.504987	--
2N2647	--	AN/ARN-118	T072	Si	JTX EQU	AUF	71A	0.30000	--	--	1451	0	0.849786	--
2N2647	--	COMMERCIAL	T072	Si	JTX EQU	GB	40A	0.30000	--	--	10275	0	13.357500	--
2N6027	--	COMMERCIAL	RD85	Si	PLASTIC	GB	40A	--	--	--	6803	3	8.843900	0.33922
2N6028	--	COMMERCIAL	T092	Si	PLASTIC	GB	40A	0.37500	--	--	3322	2	4.318600	0.46311

Transistor Section

Test Type : TEST

Device : TRANSISTOR, MICROWAVE/RF, FIELD EFFECT

Part Number	Slash Number	Equipment Reference	Package Type	Semi. Material	Quality Level	App Env	Temp °C	Rated Power (W)	Voltage Stress	Current Stress	Freq. Band	Duty Cyc.	Parts Tested	Number Failed	Part Hours	Failure Rate (f/10E6 Hrs)
..	..	N/A	..	GaAs	..	...	175J	5.20000	..	..	C	..	139	1	1.059500	0.94384
..	..	N/A	..	GaAs	..	...	210J	5.20000	..	..	C	..	36	0	0.015320	..
..	..	N/A	..	GaAs	..	...	228J	0.25000	..	..	X	..	7	4	0.014387	278.02878
..	..	N/A	..	GaAs	..	...	200J	5.20000	..	..	C	..	6	0	0.134100	..
..	..	N/A	..	GaAs	..	...	210J	5.20000	..	..	C	..	24	0	0.147800	..
..	..	N/A	..	GaAs	..	...	210J	5.20000	..	..	C	..	14	0	0.028100	..
..	..	N/A	..	GaAs	..	...	250J	5.20000	..	..	C	..	16	0	0.063500	..
..	..	N/A	..	GaAs	..	...	250J	5.20000	..	..	C	..	16	0	0.097800	..
..	..	N/A	..	GaAs	..	...	275J	..	..	..	C	..	..	1	0.000109	9174.31193
..	..	N/A	..	GaAs	..	...	228J	0.11000	..	..	X	..	..	4	0.008400	476.19048
..	..	N/A	..	GaAs	..	...	218J	0.19000	..	..	X	..	..	0	0.002600	..
..	..	N/A	..	GaAs	..	...	220J	<0.10000	..	..	C	..	..	30	0.021160	1417.76938
..	..	N/A	..	GaAs	..	...	274J	..	..	..	X	..	..	3	0.000825	3636.36364
..	..	N/A	..	GaAs	..	...	218J	..	..	..	X	..	..	1	0.001800	555.55556
..	..	N/A	..	GaAs	..	...	275J	1.00000	..	..	C	..	..	13	0.008500	1529.41176
..	..	N/A	..	GaAs	..	...	225J	1.00000	..	..	C	..	..	4	0.077100	51.88067
..	..	N/A	..	GaAs	..	...	208J	2.50000	..	..	C	..	..	8	0.033000	242.42424
..	..	N/A	..	GaAs	..	...	240J	<0.10000	..	..	C	..	..	24	0.022960	1045.29617
..	..	N/A	..	GaAs	..	...	150J	2.00000	..	..	C	..	..	8	0.014000	571.42857
..	..	N/A	..	GaAs	..	...	190J	2.00000	..	..	C	..	..	11	0.004200	2619.04762
..	..	N/A	..	GaAs	..	...	225J	2.00000	..	..	C	..	..	6	0.001040	5769.23077
..	..	N/A	..	GaAs	..	...	180J	6.00000	..	..	C	..	..	8	0.068960	116.00928
..	..	N/A	..	GaAs	..	...	240J	6.00000	..	..	C	..	..	8	0.027300	293.04029
..	..	N/A	..	GaAs	..	...	270J	6.00000	..	..	C	..	..	8	0.006560	1219.51220
..	..	N/A	..	GaAs	..	...	240J	<0.10000	..	..	C	..	..	5	0.004765	1049.31794
..	..	N/A	..	GaAs	..	...	280J	..	..	..	X	..	..	7	0.000840	8333.33333
..	..	N/A	..	GaAs	..	...	260J	<0.10000	..	..	C	..	..	22	0.012600	1746.03175
..	..	N/A	..	GaAs	..	...	200J	<0.10000	..	..	C	..	..	6	0.010000	600.00000
..	..	N/A	..	GaAs	..	...	265J	2.50000	..	..	C	..	..	66	0.088000	750.00000
..	..	N/A	..	GaAs	..	...	220J	<0.10000	..	..	C	..	..	10	0.007800	1282.05128
..	..	N/A	..	GaAs	..	...	160J	2.50000	..	..	C	..	..	4	0.146000	27.39726

Transistor Section

Test Type : TEST

Device : TRANSISTOR, MICROWAVE/RF, FIELD EFFECT (CONTINUED FROM PREVIOUS PAGE)

Part Number	Slash Number	Equipment Reference	Package Type	Semi. Material	Quality Level	App Env	Temp °C	Rated Power (W)	Voltage Stress	Current Stress	Freq. Band	Duty Cyc.	Parts Tested	Number Failed	Part Hours (E06)	Failure Rate (f/10E6 Hrs)
..	..	N/A	..	GaAs	..	---	230J	..	..	..	C	..	..	1	0.001645	607.90274
..	..	N/A	..	GaAs	..	---	250J	1.00000	..	..	C	..	..	10	0.105000	95.23810
..	..	N/A	..	GaAs	..	---	260J	<0.10000	..	..	C	..	..	11	0.003300	3333.33333
..	..	N/A	..	GaAs	..	---	200J	..	..	..	X	..	..	1	0.002200	454.54545
..	..	N/A	..	GaAs	..	---	249J	..	..	..	X	..	..	1	0.000620	1612.90323
..	..	N/A	..	GaAs	..	---	255J	..	..	..	C	..	..	1	0.000254	3937.00787
..	..	N/A	..	GaAs	..	---	200J	<0.10000	..	..	C	..	..	21	0.026539	791.28829
RLK 9027	..	N/A	..	GaAs	..	---	280J	0.50000	..	..	X	..	7	7	0.000900	7777.77778

Test Type : FIELD

Device : TRANSISTOR, MICROWAVE/RF, FIELD EFFECT

Part Number	Slash Number	Equipment Reference	Package Type	Semi. Material	Quality Level	App Env	Temp °C	Rated Power (W)	Voltage Stress	Current Stress	Freq. Band	Duty Cyc.	Parts Tested	Number Failed	Part Hours (E06)	Failure Rate (f/10E6 Hrs)
2N4342	..	COMMERCIAL	T072	Si	PLASTIC	GB	40A	0.31000	..	..	..	..	4140	3	5.382000	0.55741
2N4416	..	COMMERCIAL	T072	Si	PLASTIC	GB	40A	0.30000	..	..	..	..	20172	7	26.223600	0.26694

Test Type : FIELD

Device : TRANSISTOR, MICROWAVE/RF, BIPOLAR

Part Number	Slash Number	Equipment Reference	Package Type	Semi. Material	Quality Level	App Env	Temp °C	Rated Power (W)	Voltage Stress	Current Stress	Freq. Band	Duty Cyc.	Parts Tested	Number Failed	Part Hours (E06)	Failure Rate (f/10E6 Hrs)
..	..	AN/TPS-59	..	Si	JTX EQU	GM	125J	45.00000	..	..	L	20%	7188	14	14.400000	0.97222
..	..	PAVE PAWS	..	Si	JTX EQU	GF	140J	130.00000	..	..	<1GHz	30%	28800	416	251.300000	1.65539
..	..	PAVE PAWS	..	Si	JTX EQU	GF	100J	11.00000	..	..	<1GHz	30%	7200	56	62.800000	0.89172
..	..	PAVE PAWS	..	Si	JTX EQU	GF	110J	42.00000	..	..	<1GHz	30%	14400	49	129.700000	0.37779
..	..	ITT VORTAC	..	Si	JTX EQU	GF	125J	200.00000	..	..	C	4%	3600	1611	484.000000	3.32851
..	..	ITT VORTAC	..	Si	JTX EQU	GF	175J	200.00000	..	..	C	4%	900	402	124.000000	3.24194
..	..	R/C WXR	..	Si	JTX EQU	---	165J	400.00000	..	..	<1GHz	1%	..	18	1.300000	13.84615
..	..	R/C WXR	..	Si	JTX EQU	---	165J	200.00000	..	..	<1GHz	1%	..	4	0.650000	6.15385
..	..	R/C LRA	..	Si	JTX EQU	---	143J	4.00000	..	..	C	100%	..	4	3.130000	1.27796
..	..	R/C TPR	..	Si	JAN EQU	---	145J	60.00000	..	..	L	1%	..	1	0.740000	1.35135
..	..	R/C TPR	..	Si	JAN EQU	---	155J	220.00000	..	..	L	1%	..	3	1.190000	2.52101

Transistor Section

Test Type : FIELD

Device : TRANSISTOR, MICROWAVE/RF, BIPOLAR (CONTINUED FROM PREVIOUS PAGE)

Part Number	Slash Number	Equipment Reference	Package Type	Semi. Material	Quality Level	App Env	Temp °C	Rated Power (W)	Voltage Stress	Current Stress	Freq. Band	Duty Cyc.	Parts Tested	Number Failed	Part Hours (E06)	Failure Rate (f/10E6 Hrs)
--	--	R/C DME	--	Si	JTX EQU	---	150J	200.03000	--	--	L	1%	--	1	1.620000	0.61728
--	--	R/C DME	--	Si	JAN EQU	---	155J	300.03000	--	--	L	1%	--	2	3.240000	0.61728
--	--	R/C TACAN	--	Si	JTX EQU	AI	130J	25.03000	--	--	L	1%	--	8	7.400000	1.08108
--	--	SEEK IGLOO	--	Si	JTX EQU	GF	153J	45.03000	--	--	L	18%	1452	11	20.490000	0.53685
--	--	B3D	--	Si	JTX EQU	GF	155J	45.03000	--	--	L	18%	1452	12	36.740000	0.32662
2N2484	376	AN/BRD-7	T018	Si	JANTX	NSB	25A	0.35000	--	--	--	100%	784	0	2.489060	--
2N4035	--	COMMERCIAL	T018	Si	PLASTIC	GB	40A	0.35000	--	--	--	--	53094	108	69.022200	1.56471
2N4959	--	COMMERCIAL	T072	Si	PLASTIC	GB	40A	0.23000	--	--	--	--	25416	2	33.040800	0.06053
2N5109	453	AN/ARN-118	T03	Si	JANTX	AUC	71A	1.00000	0.613	0.025	--	--	9064	1	8.563036	0.11678
2N5109	453	AN/ARN-118	T03	Si	JANTX	AUT	71A	1.00000	0.613	0.025	--	--	3760	0	5.526444	--
2N5109	453	AN/ARN-118	T03	Si	JANTX	AUB	71A	1.00000	0.613	0.025	--	--	1504	3	2.274952	1.31871
2N5109	453	AN/ARN-118	T03	Si	JANTX	AUA	71A	1.00000	0.613	0.025	--	--	2604	0	2.019948	--
2N5109	453	AN/ARN-118	T03	Si	JANTX	AUF	71A	1.00000	0.613	0.025	--	--	5804	2	3.399144	0.58838
2N5109	453	AN/BRD-7	T03	Si	JANTX	NSB	25A	1.00000	--	--	--	100%	896	1	2.844640	0.35154
2N5583	--	COMMERCIAL	T039	Si	PLASTIC	GB	40A	5.00000	--	--	--	--	44609	15	57.991700	0.25866

Test Type : FIELD

Device : TRANSISTOR, MULTIPLE, COMPLEMENTARY PAIR

Part Number	Slash Number	Equipment Reference	Package Type	Semi. Material	Quality Level	App Env	Temp °C	Rated Power (W)	Voltage Stress	Current Stress	Parts Tested	Number Failed	Part Hours (E06)	Failure Rate (f/10E6 Hrs)
2N3055	407	AN/BRD-7	T03	Si	JANTX	NSB	25A	115.00000	--	--	204	0	6.489335	--

Test Type : FIELD

Device : TRANSISTOR, MULTIPLE, DARLINGTON

Part Number	Slash Number	Equipment Reference	Package Type	Semi. Material	Quality Level	App Env	Temp °C	Rated Power (W)	Voltage Stress	Current Stress	Parts Tested	Number Failed	Part Hours (E06)	Failure Rate (f/10E6 Hrs)
2N6295	--	AN/ARN-118	T066	Si	JTX EQU	AUC	71A	50.00000	--	--	2266	0	2.140759	--
2N6295	--	AN/ARN-118	T066	Si	JTX EQU	AUT	71A	50.00000	--	--	940	1	1.381611	0.72379
2N6295	--	AN/ARN-118	T066	Si	JTX EQU	AUB	71A	50.00000	--	--	376	0	0.568738	--

Transistor Section

Test Type : FIELD

Device : TRANSISTOR, MULTIPLE, DARLINGTON (CONTINUED FROM PREVIOUS PAGE)

Part Number	Slash Number	Equipment Reference	Package Type	Semi. Material	Quality Level	App Env	Temp °C	Rated Power (W)	Voltage Stress	Current Stress	Parts Tested	Number Failed	Part Hours	Failure Rate (f/10E6 Hrs)
2N6295	--	AN/ARN-118	T066	Si	JTX EQU	AUA	71A	50.00000	--	--	651	2	0.504987	3.96050
2N6295	--	AN/ARN-118	T066	Si	JTX EQU	AUF	71A	50.00000	--	--	1451	2	0.848023	2.35843
MJ1001	--	AN/ARN-118	T03	Si	JTX EQU	AUC	71A	90.00000	0.650	0.004	4532	1	4.281518	0.23356
MJ1001	--	AN/ARN-118	T03	Si	JTX EQU	AUC	71A	90.00000	0.650	0.004	4532	5	4.281518	1.16781
MJ1001	--	AN/ARN-118	T03	Si	JTX EQU	AUC	71A	90.00000	0.281	0.025	2266	0	2.140759	--
MJ1001	--	AN/ARN-118	T03	Si	JTX EQU	AUC	71A	90.00000	0.650	0.004	2266	0	2.140759	--
MJ1001	--	AN/ARN-118	T03	Si	JTX EQU	AUC	71A	90.00000	0.281	0.025	2266	0	2.140759	--
MJ1001	--	AN/ARN-118	T03	Si	JTX EQU	AUC	71A	90.00000	0.650	0.004	2266	1	2.140759	0.46712
MJ1001	--	AN/APN-118	T03	Si	JTX EQU	AUT	71A	90.00000	0.281	0.025	940	0	1.381611	--
MJ1001	--	AN/ARN-118	T03	Si	JTX EQU	AUT	71A	90.00000	0.650	0.004	940	3	1.381611	2.17138
MJ1001	--	AN/ARN-118	T03	Si	JTX EQU	AUT	71A	90.00000	0.650	0.004	1880	1	2.763222	0.36190
MJ1001	--	AN/ARN-118	T03	Si	JTX EQU	AUT	71A	90.00000	0.650	0.004	940	0	1.381611	--
MJ1001	--	AN/ARN-118	T03	Si	JTX EQU	AUT	71A	90.00000	0.650	0.004	1880	2	2.763222	0.72379
MJ1001	--	AN/ARN-118	T03	Si	JTX EQU	AUT	71A	90.00000	0.281	0.025	940	1	1.381611	0.72379
MJ1001	--	AN/ARN-118	T03	Si	JTX EQU	AUB	71A	90.00000	0.281	0.025	376	0	0.568738	--
MJ1001	--	AN/ARN-118	T03	Si	JTX EQU	AUB	71A	90.00000	0.281	0.025	376	0	0.568738	--
MJ1001	--	AN/ARN-118	T03	Si	JTX EQU	AUB	71A	90.00000	0.650	0.004	376	0	0.568738	--
MJ1001	--	AN/ARN-118	T03	Si	JTX EQU	AUB	71A	90.00000	0.650	0.004	752	0	1.137476	--
MJ1001	--	AN/ARN-118	T03	Si	JTX EQU	AUB	71A	90.00000	0.650	0.004	376	0	0.568738	--
MJ1001	--	AN/ARN-118	T03	Si	JTX EQU	AUB	71A	90.00000	0.650	0.004	752	0	1.137476	--
MJ1001	--	AN/ARN-118	T03	Si	JTX EQU	AUB	71A	90.00000	0.650	0.004	2902	0	1.696046	--
MJ1001	--	AN/ARN-118	T03	Si	JTX EQU	AUA	71A	90.00000	0.650	0.004	651	0	0.504987	--
MJ1001	--	AN/ARN-118	T03	Si	JTX EQU	AUA	71A	90.00000	0.650	0.004	1303	1	1.009974	0.99012
MJ1001	--	AN/ARN-118	T03	Si	JTX EQU	AUA	71A	90.00000	0.281	0.025	651	0	0.504987	--
MJ1001	--	AN/ARN-118	T03	Si	JTX EQU	AUA	71A	90.00000	0.281	0.025	651	0	0.504987	--
MJ1001	--	AN/ARN-118	T03	Si	JTX EQU	AUA	71A	90.00000	0.650	0.004	651	0	0.504987	--
MJ1001	--	AN/ARN-118	T03	Si	JTX EQU	AUA	71A	90.00000	0.650	0.004	1303	1	1.009974	0.99012
MJ1001	--	AN/ARN-118	T03	Si	JTX EQU	AUF	71A	90.00000	0.650	0.004	1451	1	0.848023	1.17921
MJ1001	--	AN/ARN-118	T03	Si	JTX EQU	AUF	71A	90.00000	0.650	0.004	2902	1	1.696046	0.58961
MJ1001	--	AN/ARN-118	T03	Si	JTX EQU	AUF	71A	90.00000	0.650	0.004	1451	1	0.848023	1.17921
MJ1001	--	AN/ARN-118	T03	Si	JTX EQU	AUF	71A	90.00000	0.281	0.025	1451	0	0.848023	--
MJ1001	--	AN/ARN-118	T03	Si	JTX EQU	AUF	71A	90.00000	0.281	0.025	1451	2	0.848023	2.35843
MJ901	--	AN/ARN-118	T03	Si	JTX EQU	AUC	71A	90.00000	0.650	0.004	1574	1	1.487110	0.67245

Transistor Section

Test Type : FIELD

Device : TRANSISTOR, MULTIPLE, DARLINGTON (CONTINUED FROM PREVIOUS PAGE)

Part Number	Slash Number	Equipment Reference	Package Type	Semi. Material	Quality Level	App Env	Temp °C	Rated Power (W)	Voltage Stress	Current Stress	Parts Tested	Number Failed	Part Hours (E06)	Failure Rate (f/10E6 Hrs)
MJ901	--	AN/ARN-118	T03	Si	JTX EQU	AUC	71A	90.00000	0.650	0.004	3399	4	3.211138	1.24566
MJ901	--	AN/ARN-118	T03	Si	JTX EQU	AUC	71A	90.00000	0.281	0.025	1574	1	1.487110	0.67245
MJ901	--	AN/ARN-118	T03	Si	JTX EQU	AUC	71A	90.00000	0.650	0.004	1574	2	1.487110	1.34489
MJ901	--	AN/ARN-118	T03	Si	JTX EQU	AUC	71A	90.00000	0.281	0.025	1574	0	1.487110	--
MJ901	--	AN/ARN-118	T03	Si	JTX EQU	AUC	71A	90.00000	0.281	--	3399	7	3.211138	2.17991
MJ901	--	AN/ARN-118	T03	Si	JTX EQU	AUT	71A	90.00000	0.281	0.025	705	0	1.036208	--
MJ901	--	AN/ARN-118	T03	Si	JTX EQU	AUT	71A	90.00000	0.650	0.004	1410	1	2.072416	0.48253
MJ901	--	AN/ARN-118	T03	Si	JTX EQU	AUT	71A	90.00000	0.281	0.025	705	1	1.036208	0.96506
MJ901	--	AN/ARN-118	T03	Si	JTX EQU	AUT	71A	90.00000	0.281	--	1410	1	2.072416	0.48253
MJ901	--	AN/ARN-118	T03	Si	JTX EQU	AUT	71A	90.00000	0.650	0.004	705	1	1.036208	0.96506
MJ901	--	AN/ARN-118	T03	Si	JTX EQU	AUT	71A	90.00000	0.650	0.004	705	3	1.036208	2.89517
MJ901	--	AN/ARN-118	T03	Si	JTX EQU	AUB	71A	90.00000	0.650	0.004	564	0	0.853107	--
MJ901	--	AN/ARN-118	T03	Si	JTX EQU	AUB	71A	90.00000	0.281	--	564	0	0.853107	--
MJ901	--	AN/ARN-118	T03	Si	JTX EQU	AUB	71A	90.00000	0.281	0.025	282	1	0.426553	2.34437
MJ901	--	AN/ARN-118	T03	Si	JTX EQU	AUB	71A	90.00000	0.281	0.025	282	0	0.426553	--
MJ901	--	AN/ARN-118	T03	Si	JTX EQU	AUB	71A	90.00000	0.650	0.004	282	0	0.426553	--
MJ901	--	AN/ARN-118	T03	Si	JTX EQU	AUB	71A	90.00000	0.650	0.004	282	0	0.426553	--
MJ901	--	AN/ARN-118	T03	Si	JTX EQU	AUA	71A	90.00000	0.281	0.025	488	0	0.378740	--
MJ901	--	AN/ARN-118	T03	Si	JTX EQU	AUA	71A	90.00000	0.281	--	977	1	0.757481	1.32017
MJ901	--	AN/ARN-118	T03	Si	JTX EQU	AUA	71A	90.00000	0.650	0.004	488	0	0.378740	--
MJ901	--	AN/ARN-118	T03	Si	JTX EQU	AUA	71A	90.00000	0.650	0.004	977	1	0.757481	1.32017
MJ901	--	AN/ARN-118	T03	Si	JTX EQU	AUA	71A	90.00000	0.281	0.025	488	0	0.378440	--
MJ901	--	AN/ARN-118	T03	Si	JTX EQU	AUA	71A	90.00000	0.650	0.004	488	1	0.378740	2.64033
MJ901	--	AN/ARN-118	T03	Si	JTX EQU	AUF	71A	90.00000	0.650	0.004	1088	1	0.636017	1.57229
MJ901	--	AN/ARN-118	T03	Si	JTX EQU	AUF	71A	90.00000	0.650	0.004	1088	1	0.636017	1.57229
MJ901	--	AN/ARN-118	T03	Si	JTX EQU	AUF	71A	90.00000	0.650	0.004	2177	2	1.272034	1.57229
MJ901	--	AN/ARN-118	T03	Si	JTX EQU	AUF	71A	90.00000	0.281	--	2177	0	1.272034	--
MJ901	--	AN/ARN-118	T03	Si	JTX EQU	AUF	71A	90.00000	0.281	0.025	1088	1	0.636017	1.57229
MJ901	--	AN/ARN-118	T03	Si	JTX EQU	AUF	71A	90.00000	0.281	0.025	1088	1	0.636017	--
MJ901	--	AN/ARN-118	T03	Si	JTX EQU	AUF	71A	90.00000	0.281	0.025	1088	0	0.636017	--

Transistor Section

Test Type : FIELD

Device : TRANSISTOR, MULTIPLE, MATCHED PAIR

Part Number	Slash Number	Equipment Reference	Package Type	Semi. Material	Quality Level	App Env	Temp °C	Rated Power (W)	Voltage Stress	Current Stress	Parts Tested	Number Failed	Part Hours	Failure Rate (f/10E6 Hrs)
2N2920	355	F-16 HUD	T099	Si	JANTX	A1F	40A	0.30000	--	--	508	1	0.276358	3.61849

Test Type : FIELD

Device : TRANSISTOR, SPECIAL FUNCTION, CHOPPER

Part Number	Slash Number	Equipment Reference	Package Type	Semi. Material	Quality Level	App Env	Temp °C	Rated Power (W)	Voltage Stress	Current Stress	Parts Tested	Number Failed	Part Hours	Failure Rate (f/10E6 Hrs)
2N2944A	382	COMMERCIAL	T046	Si	PLASTIC	GB	40A	0.40000	--	--	11250	3	14.625000	0.20513
2N2946A	382	COMMERCIAL	T046	Si	PLASTIC	GB	40A	0.40000	--	--	139045	2	180.758500	0.01106

Thyristor Section

Test Type : FIELD

Device : THYRISTOR

Part Number	Slash Number	Equipment Reference	Package Type	Semi. Material	Quality Level	App Env	Temp °C	Rated Current (A)	Voltage Stress	Current Stress	Parts Tested	Number Failed	Part Hours (E06)	Failure Rate (f/10E6 Hrs)
2N2024	--	COMMERCIAL	TO94	Si	PLASTIC	GB	40A	70.00000	--	--	2345	4	3.048500	1.31212
2N2322	--	COMMERCIAL	TO5	Si	PLASTIC	GB	40A	1.60000	--	--	1959	4	2.546700	1.57066
2N3228	--	COMMERCIAL	TO66	Si	PLASTIC	GB	40A	3.20000	--	--	116	0	0.150800	--
2N3528	--	COMMERCIAL	TO8	Si	PLASTIC	GB	40A	1.30000	--	--	167920	31	218.296000	0.14201
2N3669	--	COMMERCIAL	TO3	Si	PLASTIC	GB	40A	8.00000	--	--	138433	44	179.962900	0.24449
2N3670	--	COMMERCIAL	TO3	Si	PLASTIC	GB	40A	8.00000	--	--	528	0	0.686400	--
2N3866	398	AN/BRD-7	TO3	Si	JANTX	NSB	25A	1.00000	--	--	1288	4	4.089170	0.97819
2N3899	--	COMMERCIAL	SC18	Si	PLASTIC	GB	40A	22.00000	--	--	6366	0	8.275800	--
2N4186	--	COMMERCIAL	TO3	Si	PLASTIC	GB	40A	5.00000	--	--	234261	24	304.539300	0.07881
2N4201	372	AN/ARN-118	--	Si	JANTX	AUC	71A	0.05000	--	--	4532	18	4.281518	4.20412
2N4201	372	AN/ARN-118	--	Si	JANTX	AUC	71A	0.05000	--	--	4532	18	4.281518	4.20412
2N4201	372	AN/ARN-118	--	Si	JANTX	AUT	71A	0.05000	--	--	1880	16	2.763222	5.79034
2N4201	372	AN/ARN-118	--	Si	JANTX	AUT	71A	0.05000	--	--	1880	16	2.763222	5.79034
2N4201	372	AN/ARN-118	--	Si	JANTX	AUB	71A	0.05000	--	--	752	2	1.137476	1.75828
2N4201	372	AN/ARN-118	--	Si	JANTX	AUB	71A	0.05000	--	--	752	2	1.137476	1.75828
2N4201	372	AN/ARN-118	--	Si	JANTX	AUA	71A	0.05000	--	--	1302	7	1.009974	6.93087
2N4201	372	AN/ARN-118	--	Si	JANTX	AUA	71A	0.05000	--	--	1302	7	1.009974	6.93087
2N4201	372	AN/ARN-118	--	Si	JANTX	AUF	71A	0.05000	--	--	2920	8	1.699572	4.70707
2N4201	372	AN/ARN-118	--	Si	JANTX	AUF	71A	0.05000	--	--	2902	8	1.699572	4.70707
2N4441	--	COMMERCIAL	MU10	Si	PLASTIC	GB	40A	5.00000	--	--	68100	28	88.530000	0.31628
2N4441	--	COMMERCIAL	MU10	Si	PLASTIC	GB	40A	5.00000	--	--	7504	2	9.755200	0.20502
2N4443	--	COMMERCIAL	MU10	Si	PLASTIC	GB	40A	5.00000	--	--	36509	3	47.461700	0.06321
2N5060	--	COMMERCIAL	RD2	Si	PLASTIC	GB	40A	0.22500	--	--	28192	3	36.649600	0.08186
2N5061	--	COMMERCIAL	TO92	Si	PLASTIC	GB	40A	0.25500	--	--	39828	4	51.776400	0.07726
2N682	108	AN/BRD-7	TO208	Si	JANTX	NSB	25A	0.05000	--	--	28	0	0.088895	--
2N685	108	AN/BRD-7	TO208	Si	JAN	NSB	25A	0.05000	--	--	28	0	0.088895	--

Thyristor Section

Test Type : FIELD

Device : THYRISTOR, SCR (SILICON CONTROLLED RECTIFIER)

Part Number	Slash Number	Equipment Reference	Package Type	Semi. Material	Quality Level	App Env	Temp OC	Rated Current (A)	Voltage Stress	Current Stress	Parts Tested	Number Failed	Part Hours	Failure Rate (f/10E6 Hrs)
3N81	--	COMMERCIAL	T072	Si	PLASTIC	GB	40A	0.20000	--	--	4356	1	5.662800	0.17659

Test Type : FIELD

Device : THYRISTOR, TRIAC

Part Number	Slash Number	Equipment Reference	Package Type	Semi. Material	Quality Level	App Env	Temp OC	Rated Current (A)	Voltage Stress	Current Stress	Parts Tested	Number Failed	Part Hours	Failure Rate (f/10E6 Hrs)
2N5445	--	COMMERCIAL	SC186	Si	PLASTIC	GB	40A	40.00000	--	--	894	0	1.162200	--
2N5446	--	COMMERCIAL	SC186	Si	PLASTIC	GB	40A	40.00000	--	--	29861	27	38.819300	0.69553

Test Type : FIELD

Device : THYRISTOR, TRIODE, TRIGGER

Part Number	Slash Number	Equipment Reference	Package Type	Semi. Material	Quality Level	App Env	Temp OC	Rated Current (A)	Voltage Stress	Current Stress	Parts Tested	Number Failed	Part Hours	Failure Rate (f/10E6 Hrs)
2N4987	--	COMMERCIAL	T098	Si	PLASTIC	GB	40A	1.00000	--	--	42	0	0.054600	--
2N4990	--	COMMERCIAL	T098	Si	PLASTIC	GB	40A	1.00000	--	--	5356	19	6.962800	2.72879

Optoelectronic Section

Test Type : FIELD

Device : OPTOELECTRONIC DEVICE, EMITTER, SINGLE LED

Part Number	Slash Number	Equipment Reference	Package Type	Semi. Material	Quality Level	App Env	Temp °C	Rated Current (A)	Voltage Stress	Current Stress	Parts Tested	Number Failed	Part Hours	Failure Rate (f/10E6 Hrs)
5082-4480	--	COMMERCIAL	--	Gap	PLASTIC	GB	40A	0.05000	--	--	32183	5	41.837900	0.11951
HLMP-6620	--	COMMERCIAL	PD180A	--	PLASTIC	GB	40A	0.00350	--	--	19522	7	25.378600	0.27582
HLMP-0301	--	COMMERCIAL	PD262	Gap	PLASTIC	GB	40A	0.03000	--	--	193098	0	251.027400	--
HLMP-0401	--	COMMERCIAL	PD262	Gap	PLASTIC	GB	40A	0.02000	--	--	9698	0	12.607400	--
HLMP-0504	--	COMMERCIAL	PD262	Gap	PLASTIC	GB	40A	0.03000	1.000	1.000	426	0	0.553800	--
HLMP-1000	--	COMMERCIAL	PD77M	Gap	PLASTIC	GB	40A	0.05000	--	--	1439050	0	1870.765000	--
HLMP-1002	--	COMMERCIAL	PD77M	Gap	PLASTIC	GB	40A	0.05000	--	--	5756	0	7.482800	--
HLMP-1071	--	COMMERCIAL	PD77M	Gap	PLASTIC	GB	40A	0.05000	--	--	22249	5	28.923700	0.17287
HLMP-1200	--	COMMERCIAL	PD77G	Gap	PLASTIC	GB	40A	0.05000	--	--	7052	0	0.167600	--
HLMP-1301	--	COMMERCIAL	--	Gap	PLASTIC	GB	40A	0.03000	--	--	1937741	4	2519.063300	0.00159
HLMP-1401	--	COMMERCIAL	--	Gap	PLASTIC	GB	40A	0.02000	--	--	2088470	0	2715.011000	--
HLMP-1503	--	COMMERCIAL	--	Gap	PLASTIC	GB	40A	0.03000	--	--	725361	2	942.969300	0.00212
HLMP-1503	--	COMMERCIAL	--	Gap	PLASTIC	GB	40A	0.03000	--	--	725361	2	942.969300	0.00212
HLMP-1523	--	COMMERCIAL	--	Gap	PLASTIC	GB	40A	0.03000	--	--	8143	0	10.585900	--
HLMP-1700	--	COMMERCIAL	T1	--	PLASTIC	GB	40A	0.00700	--	--	2248	0	2.922400	--
HLMP-1719	--	COMMERCIAL	T1	--	PLASTIC	GB	40A	0.00700	--	--	36	0	0.046800	--
HLMP-2300	--	COMMERCIAL	PS216	Gap	PLASTIC	GB	40A	0.03000	--	--	257496	1	334.744800	0.00299
HLMP-2350	--	COMMERCIAL	PS216	Gap	PLASTIC	GB	40A	0.03000	--	--	3795	0	4.933500	--
HLMP-2400	--	COMMERCIAL	PS216	Gap	PLASTIC	GB	40A	0.02500	--	--	281	0	0.365300	--
HLMP-2655	--	COMMERCIAL	PS225A	Gap	PLASTIC	GB	40A	0.03000	--	--	6908	0	8.980400	--
HLMP-2685	--	COMMERCIAL	PS225C	Gap	PLASTIC	GB	40A	0.03000	--	--	624	0	0.811200	--
HLMP-2755	--	COMMERCIAL	PS225A	Gap	PLASTIC	GB	40A	0.02500	--	--	8904	0	11.575200	--
HLMP-2785	--	COMMERCIAL	PS225C	Gap	PLASTIC	GB	40A	0.02500	--	--	1158	0	1.505400	--
HLMP-2885	--	COMMERCIAL	PS225C	Gap	PLASTIC	GB	40A	0.03000	--	--	446	0	0.579800	--
HLMP-3112	--	COMMERCIAL	PD280C	GaAsP	PLASTIC	GB	40A	0.02000	--	--	8867	0	11.527100	--
HLMP-3502	--	COMMERCIAL	PD50U	Gap	PLASTIC	GB	40A	0.03000	--	--	702	0	0.912600	--
HLMP-3850	--	COMMERCIAL	T13/4	Gap	PLASTIC	CB	40A	0.02000	--	--	750	0	0.975000	--
HLMP-4700	--	COMMERCIAL	T13/4	Gap	PLASTIC	CB	40A	0.00700	--	--	19044	0	24.757200	--
HLMP-5030	--	COMMERCIAL	T13/4	Gap	PLASTIC	CB	40A	0.0200C	--	--	225	0	0.292500	--
HLMP-5040	--	COMMERCIAL	T13/4	Gap	PLASTIC	CB	40A	0.02000	--	--	75	0	0.097500	--
HLMP-5050	--	COMMERCIAL	T13/4	Gap	PLASTIC	GB	40A	0.02000	--	--	1067	0	1.387100	--

Optoelectronic Section

Test Type : FIELD

Device : OPTOELECTRONIC DEVICE, EMITTER, SINGLE LED (CONTINUED FROM PREVIOUS PAGE)

Part Number	Slash Number	Equipment Reference	Package Type	Semi. Material	Quality Level	App Env	Temp °C	Rated Current (A)	Voltage Stress	Current Stress	Parts Tested	Number Failed	Part Hours (E06)	Failure Rate (f/10E6 Hrs)
HLMP-6600	--	COMMERCIAL	PD180A	GaP	PLASTIC	GB	40A	0.00960	--	--	8148	0	10.592400	--
MV-50	--	COMMERCIAL	PD36C	GaAsP	PLASTIC	GB	40A	0.03500	--	--	20478	8	26.621400	0.30051
MV-50A	--	COMMERCIAL	PD36C	GaAsP	PLASTIC	GB	40A	0.03500	--	--	1182	0	1.536600	--
MV53641	--	COMMERCIAL	T1	GaP	PLASTIC	GB	40A	0.03000	--	--	5348	0	6.952400	--

Test Type : TEST

Device : OPTOELECTRONIC DEVICE, EMITTER, SINGLE LED, INFRARED

Part Number	Slash Number	Equipment Reference	Package Type	Semi. Material	Quality Level	App Env	Temp °C	Rated Current (A)	Voltage Stress	Current Stress	Parts Tested	Number Failed	Part Hours (E06)	Failure Rate (f/10E6 Hrs)
--	--	N/A	--	--	--	---	50A	--	--	--	20	10	0.386560	25.86921
--	--	N/A	--	--	--	---	100A	--	--	--	20	11	0.120080	91.60560
--	--	N/A	--	--	--	---	25A	--	--	--	20	18	0.516020	34.88237

Test Type : FIELD

Device : OPTOELECTRONIC DEVICE, EMITTER, SINGLE LED, INFRARED

Part Number	Slash Number	Equipment Reference	Package Type	Semi. Material	Quality Level	App Env	Temp °C	Rated Current (A)	Voltage Stress	Current Stress	Parts Tested	Number Failed	Part Hours (E06)	Failure Rate (f/10E6 Hrs)
TIL318	--	COMMERCIAL	PD27F	GaAs	PLASTIC	GB	40A	0.20000	--	--	30148	0	39.192400	--

Test Type : TEST

Device : OPTOELECTRONIC DEVICE, EMITTER, LED ARRAY

Part Number	Slash Number	Equipment Reference	Package Type	Semi. Material	Quality Level	App Env	Temp °C	Rated Current (A)	Voltage Stress	Current Stress	Diode Count	Parts Tested	Number Failed	Part Hours (E06)	Failure Rate (f/10E6 Hrs)
--	--	N/A	--	Si	--	---	245J	--	--	--	--	36	34	0.009840	3455.28455
--	--	N/A	--	Si	--	---	245J	--	--	--	--	36	35	0.007456	4694.20601
--	--	N/A	--	Si	--	---	220J	--	--	--	--	36	34	0.013192	2577.31959
--	--	N/A	--	Si	--	---	170J	--	--	--	--	36	14	0.028640	488.82682
--	--	N/A	--	Si	--	---	220J	--	--	--	--	36	28	0.020488	1366.65365
--	--	N/A	--	Si	--	---	170J	--	--	--	--	36	29	0.024976	1161.11467
--	--	N/A	TO18	GaAs	--	---	220J	--	--	--	--	11	1	0.003162	316.25553

Optoelectronic Section

Test Type : TEST

Device : OPTOELECTRONIC DEVICE, EMITTER, LED ARRAY (CONTINUED FROM PREVIOUS PAGE)

Part Number	Slash Number	Equipment Reference	Package Type	Semi. Material	Quality Level	App Env	Temp °C	Rated Current (A)	Voltage Stress	Current Stress	Diode Count	Parts Tested	Number Failed	Part Hours (E06)	Failure Rate (f/10E6 Hrs)
--	--	N/A	T018	GaAs	--	---	220J	--	--	--	--	10	1	0.003162	316.25553
--	--	N/A	--	GaAs	--	---	145A	--	--	--	--	30	14	0.081000	172.83951
--	--	N/A	T018	GaAs	--	---	220J	--	--	--	--	13	15	0.003162	4743.83302
--	--	N/A	--	GaAs	--	---	167A	--	--	--	--	30	18	0.060000	300.00000
--	--	N/A	T018	GaAs	--	---	220J	--	--	--	--	12	5	0.003162	1581.27767
--	--	N/A	--	GaAs	--	---	88A	--	--	--	--	30	9	0.189000	47.61905

Test Type : FIELD

Device : OPTOELECTRONIC DEVICE, EMITTER, LED ARRAY

Part Number	Slash Number	Equipment Reference	Package Type	Semi. Material	Quality Level	App Env	Temp °C	Rated Current (A)	Voltage Stress	Current Stress	Diode Count	Parts Tested	Number Failed	Part Hours (E06)	Failure Rate (f/10E6 Hrs)
HDSP-4830	--	COMMERCIAL	--	GaAs	PLASTIC	GB	40A	0.03000	--	--	10	740	0	0.962000	--
HLMP-2600	--	COMMERCIAL	PS225B	Gap	PLASTIC	GB	40A	0.03000	--	--	2	80463	2	104.601900	0.01912
HLMP-2620	--	COMMERCIAL	PS225E	Gap	PLASTIC	GB	40A	0.03000	--	--	4	44137	1	57.378100	0.01743
HLMP-2635	--	COMMERCIAL	PS225F	Gap	PLASTIC	GB	40A	0.03000	--	--	2	6184	0	8.039200	--
HLMP-2670	--	COMMERCIAL	PS225D	Gap	PLASTIC	GB	40A	0.03000	--	--	2	104	0	0.135200	--
HLMP-2720	--	COMMERCIAL	PS225	Gap	PLASTIC	GB	40A	0.02500	--	--	4	149	0	0.193700	--
HLMP-6203	--	COMMERCIAL	PA42	--	PLASTIC	GB	40A	0.05000	--	--	3	8977	0	11.670100	--
HLMP-6204	--	COMMERCIAL	PA42A	GaAsP	PLASTIC	GB	40A	0.05000	--	--	4	74864	0	97.323200	--
HLMP-6205	--	COMMERCIAL	PA42B	GaAsP	PLASTIC	GB	40A	0.05000	--	--	5	2058	0	2.675400	--
HLMP-6853	--	COMMERCIAL	PA42	GaAsP	PLASTIC	GB	40A	0.03000	--	--	3	160	0	0.208000	--
HLMP-6854	--	COMMERCIAL	PA42	GaAsP	PLASTIC	GB	40A	0.03000	--	--	4	160	0	0.208000	--
MV57164	--	COMMERCIAL	PD319	Gap	PLASTIC	GB	40A	0.30000	--	--	10	3	0	0.003900	--

Optoelectronic Section

Test Type : TEST

Device : OPTOELECTRONIC DEVICE, EMITTER, LASER DIODE

Part Number	Slash Number	Equipment Reference	Package Type	Semi. Material	Quality Level	App Env	Temp °C	Rated Current (A)	Voltage Stress	Current Stress	Duty Cyc.	Parts Tested	Number Failed	Part Hours (E06)	Failure Rate (f/10E6 Hrs)
--	--	N/A	--	GaAs	HERMETIC	---	65C	--	--	--	1%	9	0	0.091000	--
--	--	N/A	--	GaAs	HERMETIC	---	22C	--	--	--	1%	63	0	0.637000	--
--	--	N/A	--	AlGaAs	FACET COAT	---	70C	0.40000	--	--	100%	95	47	0.005700	8245.61404
--	--	N/A	--	AlGaAs	FACET COAT	---	70C	--	--	--	100%	12	0	0.120000	--
--	--	N/A	--	AlGaAs	FACET COAT	---	70C	--	--	--	50%	15	0	0.150000	--
--	--	N/A	--	AlGaAs	FACET COAT	---	25C	--	--	--	100%	20	0	0.010000	--
--	--	N/A	--	AlGaAs	FACET COAT	---	70C	0.40000	--	--	100%	103	64	0.006180	10355.98706
--	--	N/A	--	AlGaAs	FACET COAT	---	70C	0.10000	--	0.040	100%	40	38	0.300000	126.66667
--	--	N/A	--	AlGaAs	FACET COAT	---	70C	--	--	--	20%	7	0	0.070000	--
--	--	N/A	--	AlGaAs	FACET COAT	---	22C	0.10000	--	0.100	100%	24	7	0.560000	12.50000
--	--	N/A	--	AlGaAs	FACET COAT	---	70C	--	--	--	50%	8	0	0.080000	--
--	--	N/A	TO8	AlGaAs	FACET COAT	---	55C	0.25000	--	--	100%	72	20	0.720000	27.77778
--	--	N/A	--	AlGaAs	FACET COAT	---	22C	0.40000	--	--	100%	9	1	0.102000	9.80392
--	--	N/A	--	AlGaAs	FACET COAT	---	22C	0.10000	--	--	100%	8	2	0.154000	12.98701
--	--	N/A	--	AlGaAs	FACET COAT	---	22C	0.10000	--	--	100%	1	1	0.021000	47.61905
--	--	N/A	--	AlGaAs	FACET COAT	---	22C	0.10000	--	--	100%	2	2	0.008000	250.00000
--	--	N/A	--	AlGaAs	FACET COAT	---	70C	0.40000	--	--	100%	76	37	0.230605	160.44752
--	--	N/A	--	AlGaAs	FACET COAT	---	70C	0.10000	--	--	100%	100	74	0.450506	164.25974

Test Type : TEST

Device : OPTOELECTRONIC DEVICE, SENSOR, PHOTO DIODE

Part Number	Slash Number	Equipment Reference	Package Type	Semi. Material	Quality Level	App Env	Temp °C	Rated Current (A)	Voltage Stress	Current Stress	Parts Tested	Number Failed	Part Hours (E06)	Failure Rate (f/10E6 Hrs)
--	--	N/A	TO18	Si	--	---	150A	--	--	--	16	0	0.076800	--

Test Type : FIELD

Device : OPTOELECTRONIC DEVICE, SENSOR, PHOTO DIODE

Part Number	Slash Number	Equipment Reference	Package Type	Semi. Material	Quality Level	App Env	Temp °C	Rated Current (A)	Voltage Stress	Current Stress	Parts Tested	Number Failed	Part Hours (E06)	Failure Rate (f/10E6 Hrs)
5082-4203	--	COMMERCIAL	TO18	Si	PLASTIC	GB	40A	--	--	--	5	0	0.006500	--
5082-4203	--	COMMERCIAL	TO18	Si	PLASTIC	GB	40A	--	--	--	5	0	0.006500	--

RAC Discrete Semiconductor Device Database

Optoelectronic Section

Test Type : FIELD

Device : OPTOELECTRONIC DEVICE, SENSOR, PHOTOIODE (CONTINUED FROM PREVIOUS PAGE)

Part Number	Slash Number	Equipment Reference	Package Type	Semi. Material	Quality Level	App Env	Temp °C	Rated Current (A)	Voltage Stress	Current Stress	Parts Tested	Number Failed	Part Hours	Failure Rate (f/10E6 Hrs)
5082-4207	--	COMMERCIAL	T018	Si	PLASTIC	GB	40A	--	--	--	148	0	0.192400	--

Test Type : FIELD

Device : OPTOELECTRONIC DEVICE, SENSOR, PHOTOTRANSISTOR

Part Number	Slash Number	Equipment Reference	Package Type	Semi. Material	Quality Level	App Env	Temp °C	Rated Power (W)	Voltage Stress	Current Stress	Parts Tested	Number Failed	Part Hours	Failure Rate (f/10E6 Hrs)
T1L603	--	COMMERCIAL	PT68	Si	PLASTIC	GB	40A	0.05000	--	--	5808	7	7.550400	0.92710
T1L81	--	COMMERCIAL	PT2G	Si	PLASTIC	GB	40A	0.25000	--	--	30148	0	39.192400	--

Test Type : TEST

Device : OPTOELECTRONIC DEVICE, PHOTOCOUPLER

Part Number	Slash Number	Equipment Reference	Package Type	Semi. Material	Quality Level	App Env	Temp °C	Rated Current (A)	Voltage Stress	Current Stress	Parts Tested	Number Failed	Part Hours	Failure Rate (f/10E6 Hrs)
--	--	N/A	--	Si	--	---	125J	--	--	--	117	30	0.404880	74.09603
--	--	N/A	--	Si	--	---	200J	--	--	--	45	27	0.131840	204.79369
--	--	N/A	--	Si	--	---	225J	--	--	--	45	41	0.312488	131.20504
--	--	N/A	--	Si	--	---	250J	--	--	--	45	39	0.076680	508.60720
--	--	N/A	--	Si	--	---	200J	--	--	--	45	26	0.123944	209.77216
--	--	N/A	--	Si	--	---	250J	--	--	--	45	37	0.094312	392.31487
--	--	N/A	--	Si	--	---	250J	--	--	--	45	41	0.050840	806.45161

Test Type : FIELD

Device : OPTOELECTRONIC DEVICE, PHOTOCOUPLER

Part Number	Slash Number	Equipment Reference	Package Type	Semi. Material	Quality Level	App Env	Temp °C	Rated Current (A)	Voltage Stress	Current Stress	Parts Tested	Number Failed	Part Hours	Failure Rate (f/10E6 Hrs)
5082-5469	--	COMMERCIAL	--	Gap	PLASTIC	GB	40A	0.02000	--	--	90205	41	117.266500	0.34963

Optoelectronic Section

Test Type : FIELD

Device : OPTOELECTRONIC DEVICE, PHOTOCOUPLER, PHOTOTRANSISTOR OUTPUT

Part Number	Slash Number	Equipment Reference	Package Type	Semi. Material	Quality Level	App Env	Temp °C	Rated Power (W)	Voltage Stress	Current Stress	Parts Tested	Number Failed	Part Hours	Failure Rate (f/10E6 Hrs)
4M22	486	F-16 HUD	PH13	Si	JANTX	A1F	40A	0.30100	--	--	1016	0	0.552697	--
4M22A	486	F-16 HUD	PH13	Si	JANTX	A1F	40A	0.30000	--	--	1016	0	0.552697	--
4M25	--	COMMERCIAL	730A-1	GaAs	PLASTIC	GB	40A	0.25000	--	--	2464	0	3.203200	--
5082-5473	--	COMMERCIAL	8P-DIP	--	PLASTIC	GB	40A	0.10000	--	--	21018	14	27.323400	0.51238
6M136	--	COMMERCIAL	PH56E	--	PLASTIC	GB	40A	0.04500	--	--	90691	51	117.898300	0.43258
HCPL-2602	--	COMMERCIAL	PH56E	--	PLASTIC	GB	40A	0.04300	--	--	33	0	0.042900	--
HCPL-2631	--	COMMERCIAL	PH56E	--	PLASTIC	GB	40A	0.08100	--	--	4872	0	6.333600	--
ILD-74	--	COMMERCIAL	PH56F	GaAs	PLASTIC	GB	40A	0.40000	--	--	3785	9	4.920500	1.82908
MCT210	--	COMMERCIAL	PH16J	GaAs	PLASTIC	GB	40A	0.26000	--	--	315	0	0.409500	--
MCT274	--	COMMERCIAL	PH16V	GaAs	PLASTIC	GB	40A	0.26000	--	--	232	0	0.301600	--
TIL116	--	COMMERCIAL	PH16	GaAs	PLASTIC	GB	40A	0.25000	--	--	22183	34	28.837900	1.17900

Test Type : FIELD

Device : OPTOELECTRONIC DEVICE, PHOTOCOUPLER, PHOTODARLINGTON OUTPUT

Part Number	Slash Number	Equipment Reference	Package Type	Semi. Material	Quality Level	App Env	Temp °C	Rated Power (W)	Voltage Stress	Current Stress	Parts Tested	Number Failed	Part Hours	Failure Rate (f/10E6 Hrs)
6M139	--	COMMERCIAL	PH56E	--	PLASTIC	GB	40A	0.03500	--	--	22621	1	29.407300	0.03401

Test Type : FIELD

Device : OPTOELECTRONIC DEVICE, PHOTOCOUPLER, IC OUTPUT

Part Number	Slash Number	Equipment Reference	Package Type	Semi. Material	Quality Level	App Env	Temp °C	Rated Current (A)	Voltage Stress	Current Stress	Parts Tested	Number Failed	Part Hours	Failure Rate (f/10E6 Hrs)
HCPL-2400	--	COMMERCIAL	8P-DIP	--	PLASTIC	G3	40A	0.01000	--	--	398	0	0.517400	--
HCPL-2531	--	COMMERCIAL	PH56E	--	PLASTIC	G3	40A	0.02500	--	--	156964	61	204.053200	0.29894
HCPL-2730	--	COMMERCIAL	PH56E	--	PLASTIC	G8	40A	0.02000	--	--	1841	0	2.393300	--
HCPL-2731	--	COMMERCIAL	PH56E	--	PLASTIC	GB	40A	0.02000	--	--	33243	0	43.215900	--

Optoelectronic Section

Test Type : FIELD

Device : OPTOELECTRONIC DEVICE, ALPHA NUMERIC DISPLAY, LED, SEGMENT TYPE

Part Number	Slash Number	Equipment Reference	Package Type	Semi. Material	Quality Level	App Env	Temp °C	Rated Current (A)	Voltage Stress	Current Stress	Char Count	Diode Count	Parts Tested	Number Failed	Part Hours	Failure Rate (f/10E6 Hrs)
5082-5634	--	COMMERCIAL	PY635	Gap	PLASTIC	GB	40A	0.17500	--	--	1	7	17498	0	22.747400	--
5082-5635	--	COMMERCIAL	PY758	Gap	PLASTIC	GB	40A	0.07000	--	--	4	28	21339	1	27.740700	0.03605
5082-5636	--	COMMERCIAL	PY635	Gap	PLASTIC	GB	40A	0.17500	--	--	1	7	228639	6	297.230700	0.02019
5082-5638	--	COMMERCIAL	--	Gap	PLASTIC	GB	40A	0.17500	--	--	1	7	288102	17	374.532600	0.04539
5082-5641	--	COMMERCIAL	PY58	Gap	PLASTIC	GB	40A	0.03500	--	--	5	35	3450	1	4.485000	0.22297
5082-5644	--	COMMERCIAL	PY635	Gap	PLASTIC	GB	40A	0.17500	--	--	1	7	128195	13	166.653500	0.07801
5082-5645	--	COMMERCIAL	--	Gap	PLASTIC	GB	40A	0.17500	--	--	1	7	20894	1	27.162200	0.03682
5082-5646	--	COMMERCIAL	PY58	Gap	PLASTIC	GB	40A	0.03500	--	--	5	35	7941	0	10.323300	--
5082-5653	--	COMMERCIAL	PY635B	Gap	PLASTIC	GB	40A	0.17500	--	--	1	7	11974	3	15.566200	0.19273
5082-5666	--	COMMERCIAL	--	Gap	PLASTIC	GB	40A	0.14000	--	--	1	7	487014	16	633.118200	0.02527
5082-5680	--	COMMERCIAL	--	Gap	PLASTIC	GB	40A	0.14000	--	--	1	7	205730	4	267.449000	0.01496
5082-5680	--	COMMERCIAL	PY15	Gap	PLASTIC	GB	40A	0.21000	--	--	1	7	351966	17	457.555800	0.03715
5082-7295	--	COMMERCIAL	--	Gap	PLASTIC	GB	40A	0.04900	--	--	15	105	369	0	0.479700	--
5082-7414	--	COMMERCIAL	PY373H	Gap	PLASTIC	GB	40A	0.03500	--	--	4	28	9053	0	11.768900	--
5082-7415	--	COMMERCIAL	PY58	Gap	PLASTIC	GB	40A	0.03500	--	--	5	35	3819	0	4.964700	--
5082-7610	--	COMMERCIAL	PY15	Gap	PLASTIC	GB	40A	0.21000	--	--	1	7	6748	0	8.772400	--
5082-7611	--	COMMERCIAL	PY15	Gap	PLASTIC	GB	40A	0.21000	--	--	1	7	486054	14	631.870200	0.02216
5082-7613	--	COMMERCIAL	PY437B	Gap	PLASTIC	GB	40A	0.21000	--	--	1	7	146721	1	190.737300	0.00524
5082-7616	--	COMMERCIAL	PY15	Gap	PLASTIC	GB	40A	0.21000	--	--	1	7	15881	0	20.645300	--
5082-7653	--	COMMERCIAL	--	Gap	PLASTIC	GB	40A	0.14000	--	--	1	7	58252	28	712.727600	0.03929
5082-7656	--	COMMERCIAL	PY54C	Gap	PLASTIC	GB	40A	0.17500	--	--	1	7	43633	2	56.722900	0.03526
5082-7756	--	COMMERCIAL	PY54C	Gap	PLASTIC	GB	40A	0.17500	--	--	1	7	1626	0	2.113800	--
HDSP-3731	--	COMMERCIAL	PY54	Gap	PLASTIC	GB	40A	0.28000	--	--	1	7	1980	0	2.574000	--
HDSP-3736	--	COMMERCIAL	PY54	Gap	PLASTIC	GB	40A	0.28000	--	--	2	7	1129	0	1.467700	--
HDSP-3736	--	COMMERCIAL	PY54	Gap	PLASTIC	GB	40A	0.28000	--	--	2	7	660	0	0.858000	--
HDSP-4130	--	COMMERCIAL	PY54	Gap	PLASTIC	GB	40A	0.28000	--	--	1	7	20550	1	26.715900	0.03743
HDSP-5721	--	COMMERCIAL	PY506	--	PLASTIC	GB	40A	0.14000	--	--	2	14	38	0	0.049400	--
HDSP-6504	--	COMMERCIAL	--	--	PLASTIC	GB	40A	0.11200	--	--	4	64	104	1	0.135200	7.39645

Optoelectronic Section

Test Type : FIELD

Device : OPTOELECTRONIC DEVICE, ALPHA NUMERIC DISPLAY, LED, ARRAY TYPE

Part Number	Slash Number	Equipment Reference	Package Type	Semi. Material	Quality Level	App Env	Temp °C	Rated Current (A)	Voltage Stress	Current Stress	Char Count	Diode Count	Parts Tested	Number Failed	Part Hours	Failure Rate (1/10E6 Hrs)
5082-7300	--	COMMERCIAL	PY56	GaP	PLASTIC	GB	40A	--	--	--	1	21	69715	6	90.629500	0.06620
5082-7302	--	COMMERCIAL	PY56A	GaP	PLASTIC	GB	40A	--	--	--	1	21	78272	9	101.753600	0.08845
5082-7340	--	COMMERCIAL	PY566	GaP	PLASTIC	GB	40A	--	--	--	1	20	23105	2	30.036500	0.06659
HDSP-0761	--	COMMERCIAL	--	--	PLASTIC	GB	40A	0.01000	--	--	1	20	936	0	1.216800	--
HDSP-0763	--	COMMERCIAL	--	--	PLASTIC	GB	40A	0.01000	--	--	1	15	72	0	0.093600	--
HDSP-0771	--	COMMERCIAL	--	--	PLASTIC	GB	40A	0.01000	--	--	1	20	872	0	1.133600	--
HDSP-2000	--	COMMERCIAL	--	--	PLASTIC	GB	40A	--	--	--	4	140	1058	2	1.375400	1.45412

Optoelectronic Section

RAC Discrete Device Database

Test Type : FIELD

Device : OPTOELECTRONIC DEVICE, SENSOR, PHOTOVOLTAIC MODULES

Part Number	Number Cells	Cell Diameter	Rated Peak Power (W)	Voc (V)	Isc (A)	Material	App Env	Temp °C	Number Tested	Number Failed	Part Hours (E06)	Failure Rate (f/10E 6Hrs)
110P	1	1cm	0.01	0.36	0.002	Si	GB	40A	1113	0	1.4470	..
	48	75mm	26.50	7.20	4.900	Si	GF	13A	2064	53	36.1613	1.4656
	41	75mm	22.20	23.20	1.400	Si	GF	13A	1740	3	30.4848	0.0984
	42	75mm	22.00	23.70	1.400	Si	GF	12A	728	64	26.2080	2.4420
	40	100mm	33.90	23.30	1.960	Si	GF	19A	240	65	1.7280	37.6157
	44	56mm	10.20	24.30	0.580	Si	GF	12A	1512	96	54.4320	1.7637
	42	75mm	21.80	23.70	1.400	Si	GF	10A	800	120	14.9760	8.0128

RAC Discrete Device Database

Optoelectronic Section

Test Type : TEST

Device : OPTOELECTRONIC DEVICE, ALPHA NUMERIC DISPLAY, LIQUID CRYSTAL

Part Number	Char Count	Number Segments/ Dots per Character	Rated Driving Voltage (V)	Actual Driving Voltage (V)	DC Offset Voltage (V)	Temp °C	Number Tested	Number Failed	Part Hours (E06)	Failure Rate (f/10E 6Hrs)
	4	7 Segments	3.0	12.0	--	--	20	4	0.0380	105.26315 *
	4	7 Segments	3.0	80.0	--	--	8	7	0.0013	5384.61538 *
	4	7 Segments	3.0	50.0	--	--	18	16	0.0052	3076.92308 *
	4	7 Segments	3.0	120.0	--	--	9	8	0.0057	1403.50877 *
	4	7 Segments	3.0	3.0	--	--	20	1	1.0024	0.99761 *
	4	7 Segments	--	--	--	25A	60	0	1.2450	-- **
	4	7 Segments	3.0	9.0	<0.10	80A	1127	2	1.1270	1.77462 **

Test Type : FIELD

Device : OPTOELECTRONIC DEVICE, ALPHA NUMERIC DISPLAY, LIQUID CRYSTAL

Part Number	Char Count	Number Segments/ Dots per Character	Rated Driving Voltage (V)	Actual Driving Voltage (V)	DC Offset Voltage (V)	Temp °C	App Env	Number Tested	Number Failed	Part Hours (E06)	Failure Rate (f/10E 6Hrs)
	32	35 Dots	--	--	--	40A	GB	30407	99	39.5291	2.50448

* (C) 1985 IEEE, Kitagawa, K., et. al., "Mechanisms of Misalignment Failures of Liquid Crystal Display Cells",
IEEE Transactions On Reliability, Vol R-34, No. 4, p296

** Roman, J., "A New Approach To LCD Reliability",
Electronic Packaging and Production, Sept 1986, p109

5.0 DATA SOURCES

Discrete semiconductor devices are employed in essentially all military and commercial electronic equipments. The sheer magnitude of the available equipments, each a potential candidate for discrete semiconductor device data collection, is overwhelming. For this reason, numerous data sources were evaluated based upon a predetermined set of evaluation criteria, and the best of these sources were pursued further for data.

The evaluation criteria imposed were:

- (1) Data available to the part level
- (2) Primary failures can be separated from total maintenance actions
- (3) Sufficient detail surrounding the failure conditions
- (4) Part hours can be precisely determined
- (5) Sufficient equipment hours to expect discrete semiconductor failures
- (6) Age of data
- (7) Existence of low population and state-of-the-art parts
- (8) Application environment
- (9) Diversity of discrete semiconductor part types

The data source selection task resulted in selection of a core group of sources with known failure reporting accuracy.

A major area of interest was Reliability Improvement Warranty (RIW) program data. Equipments procured under RIW contract are subjected to more thorough failure diagnosis. Also, failure documentation is much more complete than the data available through other automated military data retrieval systems. Applicable RIW equipments used for this effort are the AN/ARN-118, the F-16 Heads-Up-Display and the F-16 Flight Control Computer.

Each field data source selected is described in detail in Table 13. Data Sources 1 through 5 are the principle sources of failure data for this book, providing over 90% of the data. Sources 6 through 15 were selected specifically for microwave transistor failure data.

In the table, column one contains the data source number by which the system/equipment data in column 2 is referred to in all figures and graphs in the text. Column three is a brief description of the system/equipment including a complete description by application environment. Column five describes the data collection system through which the data was made available. Although all data sources were screened carefully according to common criteria, differences do exist and may cause natural biases within the data. For example, all commercial data collected (Source 5) was first-year warranty data. Over 75 percent of this data was from plastic encapsulated components which performed at a given reliability level during the warranty period. However, since the main concerns with plastic devices is in regard to their long-term reliability (Reference 14), these concerns are not addressed by the data. Navy 3M data is on-equipment maintenance data which is often not traceable to the precise part level, since its intent is to document maintenance activity and not specifically to provide reliability data. However, in the case of the BRD-7 (Source 4), the Navy combined these maintenance actions with careful reporting practices at the depot level and failure analysis, with the specific intent of providing pertinent reliability information. Contractor internal data tracking (Sources 6-15) refers to on-site collection of piece-part failure data by the contracting activity. Contractor field test data (Source 7) is similar, with the exception that the equipment/system is operating under fielded conditions, not to accomplish its intended mission, but to test its ability to do so. Time frame of the data refers to the period during which the data was generated. The temperature column gives an estimate of the ambient temperature of the system application with the exception of the microwave transistor data sources for which actual junction temperatures were available (indicated by a "J" following the

temperature value). The quality level designator gives the overall screening level and package hermeticity of the components within the data source. All JAN, JANTX, JAN-equivalent, and JANTX-equivalent components are hermetically sealed. The JANTX-equivalent and JAN-equivalent quality levels refer to components, namely microwave transistors, which were screened to all JANTX or JAN specifications but are not on the QPL (Qualified Parts List) because they are special application-specific components.

Although the data collection efforts for this book were concentrated on the collection of field experience data, life test data could not be ignored. For example, life test data was the only source of quantitative reliability data for GaAs power FETs. Additionally, test data is an excellent source of time-to-failure, failure mode/mechanism and temperature dependence data. Test data was pursued by making telephone contact with manufacturers and testing facilities, and by identifying documented sources of life test data.

Other device types for which significant life test data was collected are laser diodes, microwave diodes, and photocouplers. Both field and life test data are presented in the detailed data section.

In addition, failure mode and mechanism data was collected from reliability demonstration test reports on the following military equipments:

- Patriot missile
- FPS-117 (SEEK IGLOO)
- AN/TRC-176 Radio Set
- OL-275 VRC Steerable Null Processing Group (SNAP-1)
- AN/ARN-118 Navigation Set

Due to the scarcity of such data, this new data was carefully combined with the reliability demonstration data previously presented in DSR-3. All testing included was conducted in accordance with MIL-STD-781. Only primary failures (as defined in MIL-STD-721, Definitions of Terms for Reliability and Maintainability) not induced by mishandling or overstress conditions were included.

The exceptions to this are the failure mode/mechanism data for liquid crystal displays, which was obtained from a single data source of in-house testing and failure analysis of a single display type; and photovoltaic cell data which was compiled from the U.S. Department of Energy's National Photovoltaic Program. Exceptions were made for these devices due to the scarcity of available data and the absence of MIL-STD-781 type data relating to them.

**TABLE 13: DISCRETE SEMICONDUCTOR DEVICE
FIELD RELIABILITY DATA SOURCE DESCRIPTIONS**

Data Source No.	System/Equipment Nomenclature	System/Equipment Description	Manufacturer	Data Collection System	Time Frame of Data	Temperature (°C)	Quality Level of Components
1	AN/ARN-118	Airborne Radar Navigation System employed in several aircrafts and in both Airborne, Inhabited and Airborne Uninhabited environments	Rockwell Collins	Air Force RIW	1976-1979	inhabited: 55A uninhabited: 71A	JANTX
2	F-16 HUD	Heads-up-display for the Air Force F-16 Aircraft. Experiences an Airborne, Inhabited environment	Marconi Avionics, Ltd.	Air Force RIW	1979-1983	40A	JANTX
3	F-16 FCC	Flight Control Computer for the Air Force F-16 Aircraft. Experiences an Airborne, Inhabited environment.	Lear Siegler, Inc.	Air Force RIW	1979-1983	40A	JANTX
4	AN/BRD-7	Underwater radio direction finder set for Navy. Experiences Naval, submarine environment.	Sanders Associates, Inc.	Navy 3M	1974-1976	25A	9% JAN 91% JANTX
5	Commerical	Laboratory equipment experiencing a ground, benign environment	Proprietary - not available	First year warranty data	1979-1987	40A	77.5% un-screened plastic encapsulated devices 22.5% un-screened hermetic device
6	AN/FPS-115 (PAVE PAWS)	U.S. Air Force solid state UHF Phased Array Radar. Experiences a ground, fixed environment. Data presented is from Beale AFB, CA and Otis AFB, MA locations.	Raytheon	Contractor Internal data	1981-1982	110-140J	JANTX - equivalent
7	AN/TPS-59	Solid state L-Band ground transportable detecting/range bearing radar developed for U.S. Marine Corps.	General Electric	Contractor Field Test Data	1983-1985	125J	JANTX - equivalent

**TABLE 13: DISCRETE SEMICONDUCTOR DEVICE
FIELD RELIABILITY DATA SOURCE DESCRIPTIONS (CONT'D)**

Data Source No.	System/Equipment Nomenclature	System/Equipment Description	Manufacturer	Data Collection System	Time Frame of Data	Temperature (°C)	Quality Level of Components
8	AN/FPS-117 (SEEK IGLOO)	U.S. Air Force Minimally attended L-band solid state radar system. Experiences ground, fixed environment	General Electric	Contractor Internal data tracking	1982-1985	153J	JANTX equivalent
9	B3D	Solid state L-band ground transportable detecting/range bearing radar developed for Belgium government	General Electric	Contractor Internal data tracking	1980-1985	155J	JANTX equivalent
10	VORTAC	F.A.A. Solid State Radar Set	I.T.T.	Contractor Internal data tracking	1983-1985	125-175J	JANTX - equivalent
11	R/C WXR	Detailed Description Not Available	Rockwell Collins	Contractor Internal data tracking	Not Reported	165J	JANTX - equivalent
12	R/C LRA	Detailed Description Not Available	Rockwell Collins	Contractor Internal data tracking	Not Reported	143J	JANTX - equivalent
13	R/C TPR	Detailed Description Not Available	Rockwell Collins	Contractor Internal data tracking	Not Reported	144-155J	JAN - equivalent
14	R/C DME	Detailed Description Not Available	Rockwell Collins	Contractor Internal data tracking	Not Reported	150-155J	JAN - equivalent
15	R/C TACAN	Detailed Description Not Available	Rockwell Collins	Contractor Internal data tracking	Not Reported	130J	JANTX - equivalent

APPENDIX A:
REFERENCES

REFERENCES

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